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DENTISTRY IN ONTARIO

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R. K. HOUSE

A STUDY FOR
THE COMMITTEE ON THE HEALING ARTS
1970

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FOREWORD

The Committee on the Healing Arts was established by the Province of Ontario, Order in Council 3038/66, dated July 14, 1966.

In June 1967, the Committee commissioned Professor R. K. House of the Department of Economics, York University, to undertake a study of dentistry in Ontario. The following is a study prepared by Professor House and submitted to the Committee in November 1968.

The statements and opinions contained in this study are those of Professor House, and publication of this study does not necessarily mean that all the statements and opinions are endorsed by the Committee.

I. R. Dowie, Chairman
Horace Krever
M. C. Urquhart

PREFACE

This study examines two distinct aspects of the dental industry in Ontario. Part One is an examination of specific problems which relate to the delivery of dental services and the quality of dental services in Ontario. Part Two is an examination of the governance or administration of the dental industry and the dental profession, and includes a chapter on suggested reforms. Appendix IV contains the results of the 1966 Survey of Dental Practice in Ontario. They are published here, without comment, because it is believed that they will be of wide interest to those concerned with the problems of the dental profession.

The original conception of this study was very different from the final product. One determining factor in shaping this study was the Report of the Royal Commission on Health Services and the three reports on dentistry which were undertaken and published by that Commission. Indeed, because of the specialized nature of this report, the author assumes that most of his readers either have read or are aware of the major conclusions of the studies published by the Hall Commission.

K. J. Paynter's excellent short study, *Dental Education in Canada,* and B. A. McFarlane's study, *Dental Manpower in Canada,* provide the point of departure for many of the arguments and problems taken up in the present study. Originally, material on dental education in Ontario was to have been included. The author has decided, however, that this complex question is best left to professionals. Thus, although there are a few comments scattered throughout the study, the subject has been avoided, with one important exception: the discussion of the educational process as it relates to the licensing function of the Royal College of Dental Surgeons of Ontario. The author's own research led him to concur with much of the analysis and main argument of Paynter's study, and this has provided part of the basis on which the arguments of Chapter 10 are built.

Those familiar with McFarlane's study on dental manpower and the recommendations of the Royal Commission on Health Services will recognize that large

sections of Part One are a counter-argument to some of the conclusions reached by McFarlane and the Hall Commission. The arguments here do not relate to Canada as a whole, as theirs did, only to Ontario, where they also might have reached conclusions different from those appropriate for the whole country. What is perhaps not so obvious is that considerable agreement exists between the author, and the Hall Commission and the McFarlane study. Generally Part One of this study is complementary to McFarlane's work. A major parting of the ways occurs over the significance of the population:dentist ratio, and the marginal productivity of the auxiliary to society (which is very different from her marginal productivity to the dentist).

Another major work which shaped this study is the *Survey of Dentistry,* edited by B. S. Hollingshead for the American Council on Education. Just as we attempted to avoid duplicating the work of the Royal Commission on Health Services, we have attempted to avoid duplicating the research undertaken for this major survey also. Where duplication has occurred, it is gratifying to see that the present study and the *Survey of Dentistry* reach very similar conclusions. The *Survey of Dentistry* is an important part of the background against which this study has been written.

Ultimately the decisive factor in compiling this study has been the lack of reliable research materials. At a rather late stage in the preparation of the study, it was decided to undertake a mail questionnaire or survey; that survey became the 1966 Survey of Dental Practice. Unfortunately regression studies could not be conducted, and many of the results became available too late to be used effectively in the preparation of this report.

In Part One, extensive use has been made of the data from both the 1966 Survey of Dental Practice in Ontario and the 1963 Survey of Dental Practice for Canada undertaken by the Bureau of Economic Research of the Canadian Dental Association. All figures which are not footnoted come from these surveys. Tables A6 to A21 in Appendix IV are taken from the 1966 Survey of Dental Practice in Ontario. To facilitate comparison with the 1963 Survey of Dental Practice the format of the tables is similar to the published results of the earlier survey. Figures and numbers which cannot be determined directly from the tables in Appendix IV have been determined by manual calculation from the computer print-outs, and of course no reference other than to the 1966 survey is possible.

R.K.H.

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Part One: Specific Problems

Chapter 1 Introduction

In the early nineteenth century the position of the dentist in Ontario was, in the eyes of his contemporary, something marginally above that of a horse thief and considerably below that of the blacksmith. Normally referred to as an itinerant, he had all the necessary qualifications of the vagrant, who, by his wit, nerve, and a few crude tools, literally yanked out a living. This popular image of the dentist displayed a strong bias for the more colourful members of the tradition.

In sober contrast to this jaw-breaking gypsy were the conscientious Victorian gentlemen who regarded their vocation as a profession and by whose effort even the memory of the itinerant dentist has been erased.[1] Their efforts to curb the excesses and sometimes the destructiveness of their confreres led to the proclamation of an Act Respecting Dentistry on March 4, 1868, which established the Royal College of Dental Surgeons. This Act, the first comprehensive legislation for the control of the practice and teaching of dentistry,[2] set the pattern, at least in an historical sense, for the development of the profession in the province. However, in spite of this comparatively early attempt of legislators and dentists to bring to the practice of dentistry a vestment of organization, responsibility and authority, the subsequent growth of the profession has put unsightly strains on the raiment. Happily it may be recorded that the profession has usually succeeded, if a little slowly, in tidying itself up and, in so doing, has provided high quality dental service to the citizens of Ontario. Many individuals, associations and institutions should be commended for the achievements of the profession.

Today, however, as responsible members of the profession would be the first to admit, many problems persist. Some may be traced directly to the vicissitudes of the past decade; some are of a more enduring nature; and some will always be with the profession, requiring attention almost daily. The following study is concerned with the problems associated with the practice of dentistry in Ontario.

The Practice of Dentistry in Ontario

Just as the image of the more flamboyant dentists of the nineteenth century seriously misrepresented the profession, so today does the popular image obscure

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[1]For vignettes of the history of dentistry in Canada see the *Journal of the Canadian Dental Association,* Vol. XVIII, June 1952. The entire issue is devoted to the theme "A History of Canadian Dentistry".

[2]D. W. Gullet, "History of Dentistry in Ontario", *ibid.,* p. 357.

many important aspects of it. The picture of the lone dentist in his office assisted by one or two untrained girls tends to obscure the fact that in Ontario dentistry is big business.

There are 2,732[3] dentists registered to practise in the province; they employ perhaps another 4,100[4] dental personnel, composed of typist-receptionists, chair-side assistants and dental hygienists. Supporting the dentist in the provision of his services are a further array of commercial laboratories which employ another 900[5] skilled and semi-skilled workers, and a collection of firms devoted in varying degrees to the design and construction of dental equipment and machinery. Lest these companies and the commercial laboratories overlook something of value to the practising dentist, an additional work force is employed by supply and pharmaceutical companies. These specialize in the provision of dental material and drugs, and they represent an important element in the ultimate provision of dental services.

Two universities are engaged in the training of dentists and, depending upon how one chooses to make calculations, between fifty and 260 people are engaged in the training of an additional 175 dentists per year and a further fifty dental hygienists.[6]

A statutory body, the Royal College of Dental Surgeons of Ontario, exercises authority in the education, registration and disciplining of dentists and is capable of making and carrying out quasi-judicial decisions. In contrast to this statutory body (which should be considered the creature of the government, but seldom is) exists a voluntary association of dentists — the Ontario Dental Association. The Association performs a number of functions, from the purely social to the principally academic. Both these bodies have or have had formal ties with national bodies.

Governments and government bodies, from the Legislative Assembly to municipal councils and school boards, are engaged in the collection of data, the flouridation of water supplies, the inspection of school children, and the direct provision of dental services. All this has evolved to provide dental services for

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[3]Determined by the author from the registry of the Royal College of Dental Surgeons as of the spring of 1967. Discrepancies exist in published figures for the number of dentists by year. This usually can be explained by the time of year for which the count was done, the variation being explained by the registering of the graduating class. As noted elsewhere, the number of registered dentists is at best an approximation of the number of practising dentists.

[4]Estimated by the author from the 1966 Survey of Dental Practice in Ontario, a study undertaken by the author under the auspices of the Institute of Behavioural Research, York University, the Royal College of Dental Surgeons of Ontario and the Committee on the Healing Arts, unpublished. For a discussion of the 1966 Survey see Appendix IV.

[5]*Ibid.*

[6]From submission to the Committee on the Healing Arts by the Faculties of Dentistry of the University of Toronto and the University of Western Ontario.

roughly one-third of the population of the province which regularly seeks dental care.[7] Here, then, are the dimensions within which dentistry is practised: on the one hand are some two million people who regularly seek dental care, their numbers inflated by those who casually visit a dentist or are driven to him by pain; on the other hand, these patients are serviced by government legislation, by the profession itself, comprising the dentists and ancillary workers, and by a variety of supporting business firms. A modest estimate suggests that over 8,000 persons are engaged one way or another in the provision of dental services. The way in which these services are provided is partly the result of historical accident. There has been no document or body which has concerned itself with the whole rationale or design of the industry. At various times the profession has come under scrutiny both from the public and from within its own ranks.

Without merit or justification, there does seem to be a popular propensity to confuse the industry with the profession, and it appears that the profession itself is susceptible to this type of thinking. It is useful, however, to distinguish between the profession and the industry. The industry is the whole complex vehicle by which dental services reach the patient. The profession is a part of this vehicle — its most important part. Just how present government activities fit into this picture is difficult to ascertain. Certainly some of these activities must be included in a description of the industrial complex which provides dental services, but perhaps it is more appropriate to regard the existing government activity as creating the setting in which the industry functions. The fact is that, apart from support of the universities, direct government participation in the industry has been limited, confused and seemingly purposeless.

Before undertaking to discuss the industry and profession in some detail, it is perhaps expedient to describe the general significance of dentistry in relation to the health services.

Dentistry and the General Provision of Health Services

There are two fundamental and basically different questions which may be posed in a discussion of the relation of dentistry to the general provision of health services. First, the question of the medical significance of dentistry to the total well-being of the patient may be raised; and second, the level of expenditures on dental services as compared with other health services must be considered.

Medical Significance

Some diseases, in terms of their consequences both for the patient and for the community, are more serious than others and have far more dire results. Dental

[7]The notion that "roughly one-third of the population regularly seeks dental care" is a popular one. It is not easy to document this figure, partly because of the difficulty of determining what constitutes regular dental care. Main support for the one-third estimate seems to come from an analysis of the use of the British National Health scheme and from the analysis of the utilization rates of free dental services within the armed forces.

disease is not now considered to be communicable or contagious. Therefore it does not have the social significance of the contagious disease. In terms of the individual, it seldom leads directly to the dealth of the afflicted. Therefore, in terms of its medical significance, both socially and individually, it appears to be of a lesser order of importance. It must be noted, however, that dental disease assumes this order of importance only when it is compared with terminal or contagious diseases, or with those — like poliomyelitis — which can have crippling or debilitating effects. If dental disease is considered in terms of its incidence and the suffering it causes, and if recognition is taken of the fact that it can be permanently debilitating in both a social and physical sense, then dental disease takes on an altogether different level of significance.

There appears to be a popular predisposition to judge the medical significance of a disease in terms of the first criteria and to add to them the age group at which it strikes. There is no doubt, for example, that the attention poliomyelitis received during the 1950's was due largely to the age group it principally struck. Other diseases had a higher incidence of fatality, but were socially less dramatic.

In the public mind, dental decay in children is not viewed with alarm because it is presumed, mistakenly, that the effect of decay in the deciduous teeth does not carry over to the permanent teeth.

The fact that dental disease has failed to catch the public imagination in terms of its medical significance has had peculiar effects on the development of the industry. These effects have applied to factors as diverse as the expansion of dental schools and the creation of private insurance plans. As the public becomes more sophisticated in its notions of the medical significance of various human disorders, attitudes towards dentistry will change. The attitude of perhaps two-thirds of the population, however, is that, in terms of its medical significance, dentistry is of minor importance.

Because of the persistance of ignorance, public opinion is not always what one might hope for. The majority attitude towards dentistry is regrettable, although it is true that in almost any list of priorities in the provision of health services, there are a number of services which are more important than dentistry. Just what priority dentistry should be given is a complex question. The answer hinges partly on how well the dental industry meets the present demand for its services. These questions and their answers will occupy much of this report.

Level of Expenditures

The second criterion by which the general significance of dentistry may be judged is the level of expenditures on dental services and their comparison with total expenditures on health services. This type of comparison suggests that dentistry is a major constituent of the health services sought by the community.

There would seem to be some contradiction between the suggestion that two-thirds of the community regard dental services as being of minor importance and

the expenditure data, which indicate that dental care occupies a major position in the health care expenditure pattern. The contradiction is easily resolved. The remaining third of the community which corresponds to the better educated, upper third income bracket, is capable of satisfying its demand for the full range of health care service, which includes dentistry. Since the incidence of dental disease is very high, expenditures on dental services are made fairly frequently by this group. Therefore, the initial suggestion that expenditures on dental services represent some index of the general significance of dental care for the whole community is misleading. This, however, merely points up the fact that the question of the significance of dentistry must be delicately phrased. By depending heavily on *non sequiturs,* some investigators claim to have demonstrated the crucial importance of dental services in the provision of health care; others contrive to come to precisely the opposite conclusion. By asking only slightly different questions it is possible to come to widely differing conclusions about the "importance" of dentistry.

General Opinion

Opinions on the significance of dentistry tend to vary according to the profession expressing them. Physicians and dentists do not agree on this matter, nor do they see the question in the same terms as an economist, a sociologist, a politician, or a member of the public. Public opinion, of course, varies according to where the individual sits on the educational and income ladder. In almost all the advanced countries of the western world, these factions have quarrelled over a variety of matters relating to dentistry. Each has regarded the problems from its own vantage point and usually has had very little sympathy for the views of others. Far too often interested groups have debated issues relating to dentistry on different grounds. Repeatedly, for example, one group has judged issues in terms of the "standard of the profession", while another has adopted the criterion of the "public welfare". The divergence of opinion is created by varying views on the significance of dentistry and the place it occupies in the general provision of health services. There is little agreement as to what are the most important attributes of the service, and as to whether the significance of the industry should be measured by the volume of health resources in the industry or by the implications of dental disease for the patient.

The upshot is that it is difficult — perhaps impossible — to establish a consensus on the significance of dentistry and the attention that should be devoted to it in an overall consideration of the healing arts. On the one hand, part of the community appears to consider normal dental care as a luxury good which it attempts to do without, whereas another segment of the community appears to regard dental care as a necessity. Just as the potential patients seem to diverge on the significance of dentistry, so do the more informed authorities diverge on just where dental care should fit into the individual's priorities for medical services.

The mere divergence of opinion is in itself instructive. It should caution against the tendency — very prevalent in some quarters — to depict problems relating to the healing arts and to dentistry in terms of crises which require radical and drastic measures. Before one views with alarm any problems relating to dentistry, it must be demonstrated that dentistry has some special significance which sets it apart from many other industries. If a government closely concerned itself with the activities of jewellers or philatelists, this would be regarded as highly unusual behaviour. Why, then, should dentistry merit attention? The instinctive reply that dentistry is concerned with the health of an individual is not adequate. A great many other activities are concerned with an individual's health, but they are not as closely regulated by legislation as dentistry is.

It is noteworthy that originally the dentists themselves sought government legislation to enable them to control entrance into the profession through a licensing procedure. It is not self-evident just why dentistry rather than a number of other groups should be subject to licensing. Perhaps the reasons which justify licensing are also the ones which may justify even greater public concern about the conduct of the industry. Perhaps this is why in some countries of the world there exists universal non-contributory dental care plans, and why the possibility of enacting similar schemes has been recommended to the provinces in this country.

Value Judgements

There are two possible reasons why the community at large may be interested in the dental health of an individual. The first, and in many ways the simplest, reason arises when one expresses a value judgement that all members of the community *ought* to have dental care and that it ought to be performed only by certain approved persons. It should be noted that when issues of this nature become value judgements, there is very little room for discussion. By definition, a value judgement is made without any a priori reason. It is quite simply a value to which the individual subscribes. As a value judgement or as a part of a value system, it may require qualification, amplification, and so forth, but there is no point in attempting to refute it. Value judgements are not refutable because they do not refer to how things are constituted, but how they should be constituted. Perhaps the only discussion that can arise is whether or not the particular value judgement is consistent with some wider system of values.

It seems important in a document of this nature to point out that many of the issues relating to the provision of all medical care are based on value judgements.

Cost-Benefit

The second general basis on which these issues may be discussed is cost-benefit analysis. The general principle involved is one of comparing the costs to society of undertaking a particular project with the returns society expects to get from

the expenditures made. In practice, these methods are used to choose among a collection of alternatives. Cost-benefit studies have been undertaken for a number of health care projects. Usually they concentrate on two aspects concerned with poor health. First is the direct loss to the afflicted individual. The dimension of the loss varies from lower working productivity, to a higher absentee rate, through to a curtailed working life and premature death. Second is the indirect loss — the social, as opposed to the individual, loss or cost. Some members of society may be burdened with additional costs as a result of the poor health of others. An obvious example is the case of the carrier of an infectious disease who does not receive treatment and thereby becomes a menace to other members of the community; these people will be forced to make higher health care expenditures because of the carrier. The simple principle involved here is that the good health of one individual may make it easier and less costly for others to maintain their good health. To go back to the example of the carrier, it may be to the benefit of those interested in maintaining good health to club together and see that the carrier is treated, thus lowering the cost of good health to the whole group. Society, of course, bears more direct costs too, such as the cost of maintaining the diseased person.

Added together, the costs to the individual and the costs to society represent the costs imposed by "inadequate" health services.

Need for Cost-Benefit Analysis in Dentistry

Unfortunately, the time and resources available for the preparation of this study were not sufficient to undertake a cost-benefit analysis of dentistry. This is something that must be remedied in the future because only on this or some similarly objective basis will it be possible to determine with certainty whether more resources should be directed to the industry. Casual observation on a question such as this is apt to be very misleading. For example, to note that more dentists could be gainfully employed does not lead necessarily to the conclusion that the supply of dentists should be increased. Increasing the supply of dentists may mean reducing the number of physicians, and the need for physicians may be greater than the need for dentists. Even small children learn that, when they are asked what they want, they cannot answer "everything"; but this seems to be a hard lesson for adult society — and especially for the liberal humanitarian — to learn. Even the affluence of contemporary Canadian society is unable to provide more of everything. More of one thing, particularly when it involves the use of highly trained personnel, will normally mean less of something else.

Lacking the support of cost-benefit analysis, basically what this study attempts is the identification of the "problems" which confront the dental industry. Once the problems are identified, solutions and reforms to ameliorate them will be suggested.

Chapter 2 Dental Manpower in Ontario

Nose counting has fascinated men in all ages, and for good reason. A nation cannot go to war unless it has an army; this means it requires soldiers, young men physically and mentally equipped for military combat. Dental disease, if it is to be combated, requires an army of sorts; and it is important to know both the size of the army and its components, and the possibility of increasing its size.

Although few statistical series on dentists are kept, many countries, including Canada, do record the total number of dentists licensed to practise. From these figures it is possible to study the growth of the dental "army".

The Population:Dentist Ratio

These statistics are usually expressed in terms of population:dentist ratio. Table 1 presents the absolute number of dentists and the population:dentist ratios for Canada and the ten provinces for selected years from 1881 to 1967. These comparative figures are self-explanatory, but there are two points worthy of comment.

First, it is clear that Ontario is in an "enviable" position; only British Columbia has a lower population:dentist ratio. Thus from a national point of view, Ontario appears to be relatively well equipped to combat dental disease. It is interesting that the ranking of the provinces in terms of their population: dentist ratio roughly conforms to their ranking in terms of economic prosperity. The presence or absence of a dental school appears to have little influence on the distribution of dentists throughout the nation; British Columbia, for many years, did not have a dental school.

The second point perhaps is obscured by the first. On the basis of international comparisons, Ontario appears to fall within the band of nations that represent the "average" situation. Its ratio is neither surprisingly low or appallingly high. There is little real significance in comparing Ontario with a random selection of nations, however. A more meaningful comparison would be obtained looking at the figures for other industrialized western nations; the point can be demonstrated by analyzing a table taken from B. A. McFarlane's study for the Royal Comission on Health Services, *Dental Manpower in Canada.* The Table is reproduced below with the inclusion of Ontario, which in 1962 would have slipped comfortably between Switzerland and New Zealand in the ranking.

TABLE 1

Historical Pattern of the Number of Dentists and Population: Dentist Ratios for Canada and the Provinces, 1881-1967

Year	Canada No. of dentists	Canada P/D ratio	Newfoundland D	Newfoundland P:D	Prince Edward Island D	Prince Edward Island P:D	Nova Scotia D	Nova Scotia P:D	New Brunswick D	New Brunswick P:D	Quebec D	Quebec P:D	Ontario D	Ontario P:D	Manitoba D	Manitoba P:D	Saskatchewan D	Saskatchewan P:D	Alberta D	Alberta P:D	British Columbia D	British Columbia P:D
1881	510	8,480	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1891	753	6,419	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1901	1,310	4,100	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
1911	2,183	3,301	n/a	n/a	22	4,260	125	3,949	98	3,591	327	6,134	1,127	2,242	130	3,549	89	5,533	105	3,565	160	2,453
1921	3,158	2,783	n/a	n/a	22	4,028	154	3,401	112	3,463	629	3,753	1,377	2,130	217	2,812	183	4,139	191	3,081	273	1,921
1931	4,039	2,569	n/a	n/a	29	3,036	161	3,185	124	3,292	831	3,459	1,852	1,853	251	2,789	223	4,133	231	3,167	337	2,060
1941	4,210	2,733	n/a	n/a	28	3,394	178	3,247	118	3,876	933	3,571	1,891	2,003	249	2,931	219	4,091	242	3,290	352	2,323
1945	4,529	2,638	n/a	n/a	28	3,250	191	3,199	114	4,044	989	3,539	2,062	1,922	250	2,908	205	4,078	303	2,667	387	2,408
1946	4,565	2,644	n/a	n/a	28	3,286	188	3,292	105	4,448	1,014	3,511	2,107	1,898	234	3,107	191	4,361	290	2,786	408	2,326
1947	4,602	2,671	n/a	n/a	28	3,357	180	3,378	114	4,193	1,041	3,486	2,081	1,967	244	2,979	195	4,272	264	3,042	455	2,204
1948	4,601	2,728	n/a	n/a	28	3,357	192	3,203	108	4,518	1,059	3,503	2,032	2,055	251	2,944	195	4,287	272	3,033	464	2,250
1949	4,549	2,819	n/a	n/a	29	3,207	178	3,511	112	4,446	1,063	3,563	1,984	2,155	245	3,045	195	4,297	269	3,175	474	2,283
1950	4,627	2,906	19	18,158	29	3,241	171	3,678	105	4,838	1,090	3,561	1,995	2,194	240	3,154	209	3,981	283	3,127	486	2,290
1951	4,912	2,791	21	16,714	30	3,200	192	3,323	106	4,830	1,147	3,460	2,103	2,126	259	2,965	217	3,839	321	2,844	516	2,203
1952	5,071	2,763	21	17,210	29	3,394	196	3,278	110	4,688	1,208	3,357	2,154	2,134	261	2,975	218	3,815	328	2,864	546	2,134
1953	5,215	2,772	24	15,583	33	3,030	197	3,315	113	4,655	1,242	3,361	2,218	2,159	258	3,093	223	3,780	352	2,764	555	2,171
1954	5,298	2,802	32	11,969	34	2,970	198	3,348	116	4,595	1,273	3,353	2,220	2,226	262	3,088	215	4,005	371	2,728	577	2,163
1955	5,354	2,855	33	11,970	35	2,886	198	3,399	119	4,538	1,282	3,423	2,231	2,293	265	3,106	224	3,897	377	2,804	590	2,195
1956	5,416	2,898	35	11,600	33	3,030	198	3,449	122	4,484	1,294	3,491	2,270	2,320	255	3,290	217	4,046	383	2,848	609	2,204
1957	5,481	2,934	39	10,643	34	2,920	193	3,599	125	4,437	1,314	3,522	2,297	2,353	263	3,232	208	4,234	396	2,836	612	2,285
1958	5,564	2,985	41	10,341	34	2,912	191	3,670	125	4,496	1,306	3,652	2,370	2,378	246	3,504	209	4,211	412	2,825	630	2,352
1959	5,753	2,969	46	9,391	33	3,030	190	3,731	124	4,605	1,352	3,627	2,476	2,351	277	3,159	210	4,243	417	2,892	628	2,449
1960	5,780	3,025	43	10,256	35	2,886	193	3,725	114	5,105	1,384	3,630	2,477	2,410	277	3,217	192	4,724	412	3,029	653	2,400
1961	5,865	3,047	42	10,667	31	3,322	196	3,709	120	4,908	1,388	3,705	2,513	2,432	286	3,168	196	4,668	431	2,995	662	2,420
1962	5,906	3,088	43	10,648	29	3,608	190	3,879	124	4,822	1,417	3,711	2,522	2,473	283	3,257	193	4,794	434	3,069	671	2,428
1963	5,999	3,096	44	10,682	31	3,419	185	4,032	123	4,935	1,434	3,742	2,552	2,485	281	3,327	195	4,769	456	3,004	698	2,377
1964	6,103	3,096	47	10,234	32	3,344	189	4,000	121	5,074	1,446	3,781	2,599	2,481	289	3,287	187	4,989	467	3,009	726	2,335
1965	6,218	3,093	43	11,419	31	3,452	230	3,313	120	5,142	1,469	3,786	2,623	2,511	287	3,338	195	4,836	484	2,959	736	2,361
1966	6,396	3,060	43	11,581	31	3,484	230	3,309	133	4,684	1,516	3,732	2,687	2,505	288	3,340	207	4,594	501	2,896	760	2,354
1967	6,532	3,064	51	9,674	30	3,618	236	3,203	131	4,708	1,549	3,732	2,732	2,548	295	3,265	220	4,342	503	2,909	785	2,387

SOURCE: Canadian Dental Association, *Dental Personnel in Canada*, for relevant years.

TABLE 2

Population:Dentist Ratios for Selected Countries, 1956-1962

Country	Year	Population per dentist
Sweden	1958	1,500
Norway	1958	1,600
Germany	1959	1,700
Austria	1959	1,800
U.S.A.	1961	1,900
Denmark	1958	2,000
Australia	1956	2,300
Switzerland	1960	2,400
Ontario	*1962*	*2,500*
New Zealand	1959	2,600
Finland	1958	2,600
Luxembourg	1958	2,700
France	1958	3,000
Greece	1958	3,000
Canada	1962	3,100
United Kingdom	1958	3,900
Netherlands	1958	4,400
Italy	1956	5,500
Belgium	1959	6,800
Spain	1959	11,100
Portugal	1959	74,200

SOURCE: American Dental Association, *Number of Dentists in Countries of the World, 1959,* Vol. 3, No. 8, 1961.

From the above table McFarlane concluded, "the population:dentist ratio is worse in Canada than in most of the countries of the world, with the exception of the United Kingdom, with which Canada normally compares herself . . . ."[1] Canada's position in the world community may not be unduly low but, as McFarlane suggests, it certainly is low when compared with the industrialized western nations.

In determining whether another country provides a suitable basis for comparison, some index of the economic wealth or prosperity of the country usually is used. On this index Ontario ranks very high indeed. It is most meaningful, therefore, to compare Ontario with the U.S.A., Sweden and Germany. On this scale Ontario's position, given its economic status, is *not* enviable; indeed, on the

[1]B. A. McFarlane, *Dental Manpower in Canada,* Royal Commission on Health Services. Queen's Printer, Ottawa, 1964, p. 13.

basis of these crude comparisons its performance is rather mediocre. Make what one will of these comparisons, there appears to be grounds neither for smugness nor for prophecies of crisis.

The statistical series that might lead to a prophecy of crisis is the historic increase in Ontario population:dentist ratio. If one projects this series at the present rate, it appears that some day Ontario, like Portugal, could have a population:dentist ratio of 74,200; crisis, though not imminent, appears to be lurking in the future.

Except where there has been determined governmental effort to reverse the trend, or in unusual situations like Newfoundland, population:dentist ratios are increasing all over the world. In most countries the rising ratios are interpreted as the harbingers of crisis, and determined efforts are urged or undertaken to "stabilize" the ratio. These series, as exemplified in the population:dentist ratio of Table 1, and similar series which apply to other areas of the healing arts provide the basis for the much talked of "manpower shortage". Since the manpower shortage is taken so much for granted, it may seem like heresy to ask if the population:dentist ratio provides proof of an imminent shortage.

The Population:Dental Manpower Ratio

The first observation to be made is that an increase in the population:dentist ratio will not necessarily lead to a manpower shortage. An increase in the use and employment of auxiliaries can offset the relative decline in the number of dentists. This seems an elementary point, but it is often overlooked. The population:dentist ratio cannot be interpreted as the population:dental manpower ratio, although this is done constantly.[2]

The use of auxiliaries of all sorts has increased considerably within the last half century.[3] The private dental practice is evolving from a one-man, or a one-man and a scarcely trained girl, operation into a small integrated production process. In the not-too-distant past the dentist himself would have constructed most of his appliances, carved his patients' dentures, done his own billing, kept his own books, and concluded his day by sweeping and cleaning up his office. Among younger dentists and the more successful older dentists, these activities are delegated to accountants, commercial laboratories, part-time cleaning women, and, quite often, to the dentist's wife. These people release the dentist from necessary tasks involved in the operation of a private practice, in order that he may render dental services and increase his productivity.

Manpower statistics are awkward to gather because a solo dentist with no full-time employee may use the services of a wide collection of individuals, many

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[2]*Ibid., passim.*

[3]No statistical series exist for the utilization of auxiliaries in Ontario for the past fifty years. But the observation that the use of auxiliaries has increased considerably during this period is universally assented to by older dentists.

of whom could not be described as part-time employees — for example, the accountant working on a fee basis, and the cleaning woman employed by the landlord. By comparison, population:dentist ratios are easy to compile.

Although there are no reliable figures for a population:dental manpower series in Ontario, it is possible to speculate on changes in the population:dental manpower ratio between, say, 1931 when the population:dentist ratio reached a historic low, and the present. Over this period the use of auxiliary personnel has grown, but precisely how much is impossible to say. The growth probably could be termed dramatic. Thus even though the population:dentist ratio has increased by more than 30 per cent over this period, the population:dental manpower ratio would probably show a healthy and, except perhaps for the depression period, continuous fall. Such a series, if it could be constructed, undoubtedly would lead to less gloomy conclusions about an impending crisis; those dark days of advancing manpower shortage would be shifted further into the future.

Increased Productivity of the Dentist

The second important factor which the population:dentist ratio fails to take account of is the increased productivity of the dentist himself. This increased productivity could be ascribed to three factors: changes in dental technology, changes in the selection and education of dental students, and the use of auxiliary personnel. Auxiliary personnel not only release the dentist from necessary but non-dental activities, such as bookkeeping, but also can assist him in making much better use of his chairside hours. The obvious and most common example is the chairside assistant who directly increases the productivity of the dentist. The hygienist, on the other hand, if she is employed as a hygienist and not as a glorified assistant, increases the productivity of the practice and not of the dentist, except to the extent that she relieves him of less demanding but time-consuming tasks.[4] Because it is not necessary for the hygienist to work directly with the dentist, she is, in a restricted sense, a substitute for the dentist; the chairside assistant, as her name suggests, assists the dentist and complements his activity. The profession appears to have readily accepted the use of both personnel who are substitutes for non-dental functions — for example, the secretary-receptionist — and those who complement them in the performance of their dental activities — for example, the chairside assistant.[5]

Since there is a great deal of routine work requiring primarily digital skills, dentists might be expected to approve of the development of auxiliaries to act as substitute personnel in the provision of these skills. This has not been the case. The introduction of the hygienist has been slow in coming and relatively

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[4]The increase in dentist productivity due to the use of a hygienist has been verified many times over. See, for example, B. A. McFarlane, *op. cit.*, p. 170 and references listed there.

[5]Confirmation of this can be found in the 1966 Survey of Dental Practice in Ontario when compared against similar figures from the 1963 Survey of Dental Practice in Canada.

few are being trained;[6] there appears to be considerable resistance to the idea of increasing her permissible activities.[7] Suggestions that a new class of auxiliary be trained, perhaps along the lines of the New Zealand dental nurse or the New Cross Auxiliaries (both are permitted to drill and fill children's teeth), are very coolly received by the typical member of the profession.[8] In official circles, there are no proposals to create a new class of auxiliaries. This will be the subject of more extensive comment when the question of auxiliaries is considered explicitly. This digression is simply intended to suggest that the trend indicated by the population:dentist figures does not reflect either what has happened to the population:dental manpower ratio or what *could* happen to it.

The point to note here is that if the profession were to endorse the training of auxiliary personnel, which were in fact substitutes, the prophesy of doom read by some into the population:dentist ratio would become a difficult article of faith for the objective to embrace. The impact of auxiliaries, both on the productivity of the dentist and on his practice, has probably been dramatic; and there is no firm ground on which the pessimist could argue that these sources of increased productivity have been fully exploited. Recognition of the growing ratio of auxiliaries to dentists in different countries should in itself make the population:dentist ratio a highly suspect figure.

The most obvious source of increased productivity of the dentist is technological change. This is the classic source of increased productivity, and again there can be no doubt that dentistry in the past half century has been exposed to technological change; whether or not it has been a source of increased productivity, however, is probably open to question. The reasons for this doubt are interesting.

Roughly, technological advances permit us to do one of two things: first, to do something better — that is, more efficiently — than it has been done previously; and second, to do things that we have not been capable of doing before. Technology has had both these effects on dentistry.

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[6]Committee on the Healing Arts, *Proceedings,* April 3, 1967, p. 2001. It is stated by Dean Ellis of the Faculty of Dentistry that the maximum number of hygienists in a freshman class is fifty and that there is no proposal to expand the capacity.

[7]*Ibid,* p. 1952. Dr. Purvis stated before the Committee, " . . . I think the most enlightened opinion in dentistry today is that there should be a broadening of the duties of the hygienist". The opinion was expressed to the author that opposition to the expansion of the duties of the hygienists — say, to the taking of impressions — came from the body of the profession and not from its officialdom.

[8]*Ibid.,* p. 1953. Asked if an auxiliary similar to the New Zealand dental nurse might be created by expanding the duties of the hygienists, Dr. Purvis replied:

> No, no, there is quite a difference there. They are filling teeth of children and extracting teeth of children. Most of us in this area, North America area, feel that the important phase of children's dentistry which encompasses a large area of growth and development can't possibly be adequately taught to an auxiliary. . . .

Some readers may perceive a variance between this statement and Dr. Purvis' statement on p. 1952 of the *Proceedings* of the Committee quoted here in footnote 7.

When technology enables a profession to do things previously beyond its competence, there is usually some impact on what the technologists believe ought to be done. The most striking examples, of course, are in medicine. Technological advances have made it possible to prolong lives; the advance of technology simply because it exists, has changed notions of what constitutes adequate medical care.

In less dramatic terms, the same is true of dentistry. With the advance of dental technology has come an increase in the standard of what constitutes adequate dental care.[9] It is interesting to note that a large proportion of the population of most western nations still holds a rather "primitive" standard of dental care. Two-thirds of the population does not seek regular dental care and regards the dentist as someone who removes teeth rather than restores them. For those who seek regular dental care, however, the standard, like that implicitly used by the dentist, has risen. Most countries have a sizable "class" of people, characterized by higher income and more extensive educational background, among whom missing, discoloured or decayed teeth are not visible. The same technology which has permitted increased standards of dental care has increased the standard of dentistry demanded by this class.

Thus technology does not always simplify the procedures in the dentist's office; indeed, in a great many cases it demands much more skill and time. The solution to a particular dental problem once may have been a simple extraction; today it may involve a time-consuming and costly restoration. Where technology has introduced this type of change, the dentist has become less productive in a very real sense. In a given period of time he will now be able to treat fewer cases of this type. The old solution of extracting the tooth would not be acceptable to either the dentist or his patient. Thus, if the measure of productivity to be used is the number of cases which the dentist can treat, there can be little doubt that some dental technology has decreased the productivity of the dentist. Unfortunately, there is no way at present of being able to quantify accurately the impact of this type of technology.

Of course, not all dental technology has had the effect of lowering the productivity of the dentist. Indeed, the predominant effect of technology probably has been to increase his productivity. The advances in the design and equipping of his office, the introduction of new materials, and the aids which permit a quick and accurate diagnosis, all contribute to his productivity.

Technological advance, therefore, has tended to both raise and lower the productivity of the dentist, but just what the net effect has been is a subject that is ripe for research. There is no doubt, however, that if both the patient and the dentist were content with the standard of dental care prevalent fifty years ago,

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[9]There are no data available which relate to the "standards" applied over the years. Here, as in many other cases, the statement is based on the impressions of dentists.

the productivity of the dentist would have increased considerably. Unfortunately, neither would be content with this standard. Since the standard has risen it may be possible for the individual dentist — as opposed to the dentist's practice — actually to care for more patients. The contribution of technology to productivity cannot be assessed accurately without further research. Until its effects are ascertained, the annually increasing population:dentist ratio for Ontario cannot be taken to mean that things are "getting worse all the time".

The last easily distinguishable factor which affects the productivity of the dentist is the selection and training of dental students. This factor, like technology, can have the effect of either increasing or decreasing the productivity of the dentist. If the selection process has succeeded in choosing students who have an aptitude for dentistry and who enjoy the work, the productivity of the dentist as an entity may increase. The "new breed" may work longer hours, and thus in the course of a year treat more patients. They may work the same number of hours per year and yet, because of superior digital ability, work considerably faster. These considerations may be offset if the new breed are inclined to be perfectionists — that is, if the standard has risen. If there is a correlation between the selection of dental students and the standard of practice, it becomes impossible on purely a priori grounds to determine what effect the selection method has on increasing productivity. All that can be said is that if the standard remained the same, productivity would be enhanced by acquiring superior students. There are strong reasons for believing that the selection of dental students has improved in recent decades,[10] but there is every indication that the standard of practice also has changed.

Evidence of this is not documented or quantified. If some attempt were made to gather statistics on these matters, the designing of social policy would become less of a mystic art. In the absence of statistics, however, one must and can depend on the less sophisticated method of casual observation; and this suggests that the standard of practice has changed. Casual observers are almost unanimous on this point. It is reasonable to assume, therefore, that the standard has risen and continues to rise. Whether this affects the productivity of the dentist must remain a mystery until time and resources are devoted to making it a statistic.

Availability of Dental Services

The population:dentist ratio is most commonly used as an index of the availability of dental services. From the observation that the population:dentist ratio is rising,

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[10]Professor R. M. Granger, then Professor of Epidemiology and Biometrics at the University of Toronto, stated before the Committee on the Healing Arts on the issue of preselection techniques that they involved

> . . . two things, although the cutting of the failure rate in the first year is important, probably more important is that we get better — more suitable people going into the courses, and this is hard to show statistically . . . . The use of aptitude tests is not so much to cut the failure rate but to improve the quality, for the candidate's own sake, to get him into something where he is likely to be happy and useful.

as in Ontario, the conclusion usually drawn is that dental services are becoming less readily available. In the case of Ontario, this conclusion cannot be drawn from simple observation. Without other supporting evidence, all the population: dentist ratio reveals is the ratio of the population to dentists. In itself, this is not very enlightening. It is unfortunate that so much significance is attached to it.

Only under the following conditions can significance be attached to the population:dentist ratio: when the conditions of practice are believed to be the same — that is, when the mix of dental personnel (for example, the ratio of hygienists to dentists) is the same or is known approximately; when the state of dental technology is known and is the same (this will often rule out intertemporal comparisons of this ratio); when the training and selection of students are the same. To be safe, one might also add that the characteristics of the population must be the same. These are restricting conditions. They rule out many international comparisons as almost meaningless, and except for relatively short time periods, suggest that intertemporal comparisons have little value.

The significance of the figure is, of course, that it provides an index of the availability of service. Strictly speaking it should not be used as an index of the amount of service rendered; it can be used this way only if it is safe to assume that each dentist is fully employed. Whether or not the dentist is fully employed is largely dependent on the size of the population to which he administers, and on the characteristics of the population.

With these restrictions on the meaningful use of the population:dentist ratio we could use the figures in Table 1 to compare, with some confidence, the three maritime provinces, and could safely conclude that dental service is more readily available in Nova Scotia than it is in New Brunswick. But then there is the problem created by the relative distribution of the dentists within each province. A comparison between Ontario and Nova Scotia immediately runs into problems, for the characteristics of the two populations are not the same. In Ontario, with a higher per capita income, high demand for dental services may mean that access to a dentist is more difficult. This could be, and to some extent is, offset by the more extensive use of auxiliary personnel.

As most economists will be quick to realize, the notion of "access" or availability employed here is a treacherous one. Rightly, they would see the fee structure as a regulator of availability. To eliminate the effect of the fee structure, it would be necessary to assume identical rates in the two provinces. On this basis it might then become clear that Ontario, even though it has a lower population:dentist ratio, is "worse off" than Nova Scotia. In other words, taking all these restrictions and assumptions into consideration, it might then be possible to demonstrate that Ontario is less capable of meeting the effective demand for dental services than Nova Scotia; or, of course, it might be possible to prove the contrary.

The other, and for some purposes equally valid, approach might be to assume that the services were free to the patient. On this assumption, it is possible for the two provinces to change positions. If Nova Scotia were better equipped to meet the demands for dental services under a given fee schedule, then on the assumption of free services, Ontario might prove to be better equipped to meet the demand. This could occur simply because of different utilization rates in the two provinces. The utilization rate would be correlated closely to the Lorenz curve, or curve of the distribution of income within each province. This last assertion seems almost certain; in the United Kingdom where dental services are virtually free, the experience has been that utilization by the individual is closely correlated with his income.[11] The U.K. experience has something of a counterpart in the Canadian Armed Forces, where the freely available dental services are not used by all those able to do so.

In order to sweep many of these problems under an analytical carpet, it is tempting to impose on the population:dentist ratio a rather different meaning — to use it simply as an index of the absolute availability of service. It then becomes possible to ignore many of the characteristics of the population. One may ask, however, what significance the ratio has if, with a higher population:dentist ratio, some of Nova Scotia's dentists are underemployed whereas Ontario, with an apparently "better" ratio, has dentists who are overworked or simply unable to meet the demand. Clearly, the significance of the ratio under this assumption is illusory. Still, many observers have a fine capacity for entertaining an illusion and will continue to impute meaning to the population:dentist ratio on just this assumption. One may hope that the designing of social policy will not be left to them.

The proper approach to an analysis of the availability of dental services would be to employ the supply and demand analysis of economists. Unfortunately, for both theoretical and statistical reasons, this cannot be done. The latter reason arises because of the paucity of data on which to construct a demand analysis. The theoretical reasons are almost embarrassingly simple: that market performance is no measure of "adequacy" — markets merely perform the regulatory function of equating effective demand to supply. In the case of dentistry, moreover, the market performs this function rather poorly. Rather than indulging in a rough competitive market, dentists show what they believe to be professional restraint by limiting the use of either advertising or the fee schedule to attract

[11]This information was supplied to the author by officials in the British Ministry of Health during a field trip to London. There is, however, a problem of interpretation here. The British experienced a backlog effect with the introduction of National Health; once this pressure was removed the demand for dental services decreased considerably. The decrease in demand after the backlog effect, however, may have been an adjustment to the waiting period for appointments; also the dentists may have developed a bias towards those they would treat immediately. The British believe, however, that the demand for dental services is very closely tied to the socio-economic status of the individual and that this has more to do with determining the demand for *dental* services than does the fee structure.

potential patients. Thus it happens that some dentists have relatively light practices, while others accumulate long waiting lists. The growing waiting period prior to the appointment arises because the dentist, bound by his professional ethics, refuses to use his fee structure as a means of limiting the demand for his services.

Because the market is recognizably imperfect, it is very difficult to get suitable estimates for the demand for dental services. For example, there is practically nothing known about the response of demand to changes in the fee structure. What evidence is available — the experience of the Canadian Armed Forces and the National Health Plan in the United Kingdom — suggests that the demand is relatively inelastic, or unresponsive to changes in fees. Both these experiences are a little suspect, especially that in the United Kingdom, because the appearance of an inelastic demand may be due in fact to an inelastic supply. Attempting to evaluate the adequacy of dental services in terms of a market analysis is all but impossible because it is so difficult to analyze the demand side. This difficulty makes the use of population:dentist ratios almost meaningless.

It is clear also that, in the case of a market analysis, the notion of adequacy has no meaning, and that use of the term involves some sort of value judgement as to what is adequate and what is not. This is a value judgement which must be made, and which in fact currently is being made. The requirement that all dentists be licensed and the restricted number of positions in dental schools determine the available supply. This is currently the case, at least, because the number of applicants for dental school exceeds the number of available positions.[12] It is, therefore, the state and its agencies that limit the supply of dentists. This being the case, what would the appropriate supply be? The answer, again, is basically a matter of value judgement.

There is no a priori basis by which we can arrive at the optimum number of dentists or the optimum supply of dental manpower. Economists, wishing to subject the problem to cost-benefit analysis, might first think of the structures of welfare economics. Then, perhaps, the problem could be subjected to cost-benefit analysis as the only means of arriving at a reasonable decision. It should be remembered that cost-benefit analysis, rather than overcoming the problem of value judgements, simply sidesteps them either with the requirement that only "similar" projects can be compared, or with the assumption that a budget constraint is imposed. Since some aspects of the present problem would not fufill these conditions, a senior decision-maker (in the language of the welfare economist) would have to impose his own social welfare function in order to arrive at a decision.

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[12]In 1966, 1,157 applicants submitted 1,634 applications for admission to Canada's eight dental schools; 885 Canadians were among those applying for the 375 places available. Canadian Dental Association, *Applicants and Applications to Canadian Dental Schools, 1966.*

No objective optimum can be arrived at through the use of analytic reasoning which is independent of a value judgement — a judgement regarding what is believed to be "proper".

This may come as a surprise to the reader who has seen figures that are referred to as "necessary", "optimum" or "desirable" supply of manpower. In each case these figures reflect the predilection of their authors. Debates on medical manpower might be more sophisticated if the participants recognized that the selection of a figure representing the desirable supply of manpower is based ultimately on personal values. It is, of course, comforting to find an author who tells us that the ideal population:dentist ratio is, for example, 1,800:1. But this is not a scientifically calculated figure; someone else's personal values may dictate 1,500:1 or 3,000:1 as preferable figures. In an analytic investigation, each of these figures has specific implications in a particular situation. The rest of this chapter will be devoted to examining what such figures imply in Ontario's situation. Without the infusion of value judgements there is no other basis for investigating dental manpower in Ontario.

The Supply of Dentists

As noted earlier, it is difficult to estimate an accurate figure of dentists in active practice. The figures in Table 1, taken from the Canadian Dental Association, indicate that in 1967 there were 2,732 dentists in Ontario; the proceedings of the Royal College of Dental Surgeons of Ontario for the same year give a figure of 2,805. This discrepancy can be explained in part by the time of year for which the figures were compiled; the registration of the members of the graduating class will add to the total part way through each year. During the 1966 Survey of Dental Practice in Ontario, it was found that a surprising proportion of those on the registry of the RCDS were in fact no longer in private practice. Authorities in the United Kingdom believe that between 10 and 12 per cent of those registered with the General Dental Council are not practising. This figure was offered in the course of an interview held in the United Kingdom, and appears to be confirmed by McFarlane's figure of 12 per cent.[13] Similarly, work undertaken for the Bureau of Economic Research and Statistics of the American Dental Association finds that 11.3 per cent of those registered are in fact no longer in active practice.[14] A conservative figure for non-practising dentists in Ontario would be 10 per cent; it could in fact be somewhat higher. Therefore, an estimate of 2,500 dentists in active practice for 1967, the figure to be used here, is probably on the generous side.

Some elementary manipulation of the figures in Table A18 (pp. 000-000) shows that the typical dentist treats approximately 1,500 patients a year. Assum-

[13]B. A. McFarlane, *op. cit.*, p. 12.

[14]B. S. Hollingshead (ed.), *Survey of Dentistry*, American Council on Education, Washington, D.C., 1961, p. 79.

ing that there are approximately 2,500 active dentists, it can be estimated that approximately 3,750,000 persons of a population of 6,600,000 see a dentist each year. This represents 56 per cent of the population — significantly more than half. One difficulty involved in these figures, however, is that some persons see more than one dentist. The extent to which this occurs is unknown, but persons undergoing extensive dental treatment often must see at least one other dentist. To allow for this, it would be necessary to deflate the figure, perhaps by as much as 10 per cent. This leaves a convenient, although perhaps not very precise, figure of approximately 50 per cent of the population who see a dentist each year.

If the much bandied about figure of 30 or 35 per cent of the population who are reputed to seek "regular dental care" is valid for Ontario, it suggests that as much as 20 per cent of the population seek casual or emergency service from a dentist. The uncertain methods involved in arriving at this figure argue for its being treated with caution and suspicion. A further note of warning may be added here: the figure of 50 per cent does not imply that the dental resources of the province are capable of handling only half the dental needs of the population, nor does it imply that the 50 per cent who apparently do see a dentist each year receive all the dental treatment they require. Many of those who see a dentist do so only to have an extraction or some other specific service performed. By any accepted criterion of dentally fit, they may require a great deal more treatment.

The evidence here, that 50 per cent of the population see a dentist each year, is at variance with data culled from other sources and by other means. The Canadian Sickness survey undertaken in 1950-1951 found that only one in seven or approximately 14 per cent of all Canadians visited a dentist annually.[15] The comparable figure for Ontario was somewhat higher — 18 per cent. In its brief to the Royal Commission on Health Services, the Canadian Dental Association estimated that 43.5 per cent of the Ontario population received dental care in 1953; this fell to 39.5 per cent in 1958, but rose again in 1963 to 43 per cent.[16] These figures are an unbelieveable improvement over the findings of the Canadian Sickness Survey — so unbelievable as to discredit the latter. The evidence of the 1967 Survey of Dental Practice, the findings of the CDA and supporting comparative evidence for other countries, all point to error in the figures of the Canadian Sickness Survey, or to an incredibly rapid increase in the utilization of dental services. Using the data from the CDA's 1963 Survey of Dental Practice, another figure for 1963 emerges. The results of that survey indicate that the typical dentist saw approximately 1,312 patients annually; and, after the figure for the number of active dentists in Ontario at that time is adjusted, it appears that 3,013,664 persons saw a dentist during 1963, or approximately 47 per cent.

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[15]Department of National Health and Welfare and the Dominion Bureau of Statistics, *Illness and Health Care in Canada: Canadian Sickness Survey, 1950-51,* Queen's Printer, Ottawa, 1960, p. 188.

[16]Canadian Dental Association, Brief to the Royal Commission on Health Services, March 1962, p. 152.

Again, this figure may be further adjusted by the rather arbitrary 10 per cent who are presumed to have seen more than one dentist. When these figures are summarized in the following table, they suggest that an increasing percentage of the population receives dental care annually.[17]

TABLE 3

Percentage of Population which Visited Dentist, Ontario, for Various Years

Year	Percentage of population which visited dentist
1950-1951	18[1]
1953	43.5[2]
1958	39.5[2]
1963	43[2]
1966	50[3]

[1]Canadian Sickness Survey, 1950-1951.
[2]Brief by the Canadian Dental Association to the Royal Commission on Health Services, 1962.
[3]Calculated from data contained in the 1966 Survey of Dental Practice in Ontario.

Several factors can be found to explain the increasing numbers who benefit from dental care. Many of these will be discussed in the following chapters on the nature of dental practice, but they are worthy of some attention here.

Hours Worked

One explanation could be that dentists have increased both the number of hours worked per week and the number of weeks worked per year. The results of the 1963 and 1966 surveys do not confirm this. These surveys show that the number of weeks worked and the number of hours worked per week actually decreased. In 1966 the number of weeks worked was forty-six, as compared with forty-seven for 1963. Similarly, the number of hours per week in 1966 was 39.7, compared with forty-one for 1963. Thus, in 1966, the typical dentist worked 1,826 hours per year compared with 1,907 hours for 1963. The American Survey of Dentistry found that although the same amount of time was devoted to work, the typical American dentist between 1952 and 1958 increased his patient load from 1,012 to 1,184 — an increase of 15 per cent in a four-year period.[18] The comparable figure for Ontario over the three years between the 1963 Survey and the 1966 Survey is 12 per cent. In the American Survey of Dental Practice this increase in patient load was ascribed unhesitatingly to the increased productivity of the dentist. One cannot rush to this conclusion for Ontario (and perhaps not for the United States either). Part of the explanation could arise from a redistribution of dentists within the province.

[17]B. S. Hollingshead, *op. cit.*, p. 97. "Over a period of thirty years, the proportion of the population who visit the dentist within a year has doubled."
[18]*Ibid.*, p. 153.

Geographic Distribution

The following chapter is devoted to the geographic distribution of dentists within the province but it may be noted here that a shift from areas where dentists were underemployed to areas where they were fully employed would result in a higher provincial average for the number of patients seen annually.

Unfortunately, the impact of distribution on the number of patients seen annually cannot be shown by a simple study of the regional distribution of dentists. It would be necessary also to have data on the number of patients treated annually by region or county. This information is available for 1966 (see Table A18), but is not available for earlier years.

Excess Capacity

A third explanation for the increased numbers receiving dental care could be that dentists were underemployed in the past and that increased demand for dental services has taken up previously excess capacity. Fortunately again, both the 1963 and the 1966 surveys permit us to examine this possibility. The results of the dentist's own assessment of the "busyness" of his practice for both years for Ontario is given in Table 4.

TABLE 4

Category of Busyness, Ontario, 1963, 1966

Year	Category of Busyness			
	1	2	3	4
1963	39.7	22.6	30.7	7.0
1966	35.99	22.96	33.70	7.34

These figures suggest that dentists in Ontario sense that they are somewhat less "busy", or that the demand for their services is lighter than in the past. The change between 1963 and 1966 is not particularly large, but it is significant when viewed against the background of the rising population:dentist ratio and a slight decline in the length of the working year.

The rising population:dentist ratio accompanied by an increase in the annual patient load per dentist, and the shortening of the dentist's working year, coupled with evidence that the members of the profession do not see an increase in the demand for dental services which they are unable to satisfy, strongly suggest that the productivity of the dental practice has increased and continues to increase at a rate faster than the rise in the population:dentist ratio. Over the period embraced by the 1963 and 1966 surveys the population:dentist ratio has risen from 2,485 to 2,548, an increase of 2.53 per cent. The increase of 12 per cent in the number of patients treated suggests that the gains in productivity far outstrip the rise in the population:dentist ratio. Even this figure underestimates

the increase in productivity, however, because it does not take account of the fact that these gains have been accompanied by a reduction in the working year. During the period between the two surveys, the number of dentists in the province increased from 2,552 to 2,732, an increase of 180. The actual gain in the number of hours of dental service increased by an insignificant amount, from 4,866,664 to 4,988,632. This increase of 121,968 hours represents an increase of only 2.8 per cent.

The Population:Dentists' Hours Ratio

Still another way to look at the increase in the supply of dental services is to compute a population:dentists' hours ratio. This obviously provides a more accurate picture of what has happened to the availability of the services of a dentist. This rather interesting figure rose from 1.30309 to 1.37185, an increase of .06876 or 5.77 per cent. In spite of the fact that the population:dentist ratio deviated from its long-run pattern during these years and was fairly stable — actually declining slightly between 1963 and 1964 — it appears that the availability of dental hours is growing at a rate of about 5 per cent less than the rate of growth of the population. This decrease in the availability of dentists' hours is due almost entirely to the decline in the length of the working year. Over the period under study it declined by 4.24 per cent; the rest of the decline was due to the slightly more rapid growth of the population over the growth of the number of dentists.

The period embraced by the two surveys is, as already suggested, atypical because it is a period during which the population:dentist ratio was stable. This, coupled with increased productivity, may have permitted an adjustment in the length of the working year which will not be a continuing trend. It does seem likely, however, that the tendency towards a shorter working year is more than a temporary phenomenon. Dentists, like a number of other privately employed professionals, may vary the length of the working year in response to the high income tax brackets in which they find themselves. It is commonly believed that income tax rates do not affect "work effort". A great deal of the evidence which supports this belief, however, comes from the business community where the typical executive is unable to vary the length of his working year. Since he is not concerned with advancing himself within a corporate structure, the dentist is in a unique position to decide at what point he will trade off leisure time for income. Whatever the reason, dentists in Ontario are seeking and realizing more leisure time than they have in previous years. Over the period of the two surveys, this tendency has been a far more important contributor to the decline in the number of dentists' hours available than has been the relatively more rapid growth of the population. In other periods, the relative growth rate of the population most certainly assumes an importance which is not revealed by the period we are able to consider.

If the ratio of the population to the number of dentists' hours is to remain constant, the population:dentist ratio must decline; it is not sufficient for it to remain stable. Some authors and authorities, by assuming that technology neither increases nor decreases productivity, have argued that the present level of service could be maintained by stabilizing the population:dentist ratio. The desirability of maintaining a stable population:dentist ratio is suggested by arguments contained in reports of the Royal Commission on Health Services and in the American Council on Education's *Survey of Dentistry in the U.S.A.*[19] Indeed, it is generally assumed that a reduction in the population:dentist ratio is desirable.

It must be stated most emphatically that it is by no means clear that rational social policy in Ontario demands that the population:dentist ratio be stabilized or that attempts be made to lower it. Over the period between the two surveys the population of Ontario rose by an estimated 6 per cent. The total number of dentists' hours available declined by 4.2 per cent, and the population:dentist ratio rose from 2,485 to 2,505. To some observers these figures spell crisis, but this view is tenable only on the assumption that the productivity of the dentist or the dental practice is unchanged. This is incontestably not the case in Ontario.

Productivity of Dentists

During the period under study, the total number of patients seen rose from 3,348,224 to 3,941,829 — an increase of 593,605, or over 17 per cent. Viewed in terms of the increase in the population, 150 per cent more patients were seen by dentists in 1967 than in 1963. This suggests that the productivity of the dentists' practices grew at a rate 50 per cent faster than the rate of population growth during this period.

Hours per Patient Ratio

A more accurate and meaningful notion of the growth of the productivity of the dentist can be realized by a comparison of the ratio of hours per patient in both 1963 and 1966. This figure represents the number of hours of active time of the dentist devoted to each patient. On the assumption that the standard of practice has remained the same, the difference between the two ratios represents a pure measure of the increase or decrease in the productivity of the dentist. If the standard of practice has increased, the ratio will underestimate increases in productivity; if it has deteriorated, it will overestimate these increases. While there are no data on the standard of practice, the prevailing notion is that it is improving. With this in mind, the increase in the patients per hour, from .68799 in 1963 to .80333 in 1967, is very impressive. The increase of .11534 patients per hour represents an increase in productivity of 16.76 per cent. If, as is believed, the standard of practice is increasing, this figure underestimates the actual increase in productivity.

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[19]B. S. Hollingshead, *op. cit., passim.*

It would be gratifying to have comparative evidence for other professions in the healing arts to determine if this increased productivity is general or if it is peculiar to dentists. If it appeared to be fairly widespread, one could take the evidence presented here as giving an accurate picture of what in fact is happening to the availability of dentists and dental services. If it were a strange or an isolated case, one would have to be more suspicious of the figures. It is unfortunate that we are unable to examine these tendencies over a longer time period.

The only corroborating evidence comes from a survey conducted by the Canadian Dental Association during the 1950's.[20] The survey, conducted in 1958, indicated that the average patient load in Ontario was 972. The rise to 1,313 in 1963 represents a dramatic increase of almost 29 per cent. If nothing more, this indicates that the capability of dentists to see more patients has increased substantially and that this trend has been very marked for at least the past decade.

There are some difficulties in interpreting these increases as increases in productivity. First, dentists may have been under-utilized in the past, and now their services are simply being more fully utilized. If this were the case, one would have expected the number of hours spent in the dental office to have been lower at the time when the number of patients seen was appreciably less. In fact, as we have seen, the number of hours in the dental office is declining as the number of patients seen is increasing. This simply is not compatible with the assumption that dentists are now becoming more busy. The assumption that the increase in the number of patients seen is due to greater utilization, and not to an increase in productivity, is contradicted also by the direct subjective evidence of the estimates by the dentists of how busy they are. The evidence already presented indicates that they sense less unmet demand for dental services than was the case in 1963.

It is also possible that the apparent increase in the productivity of the dentist is due not so much to the dentist, but to the patient. It is possible that among those who regularly seek dental services there is a decrease in the incidence of dental decay. Such a decline would mean that the dentist would spend a greater proportion of time simply examining patients and less time actually restoring or correcting dental deficiencies. Obviously, under these conditions, he would be capable of seeing more patients.

Unfortunately, there is little point in appealing to general indices to find out what has been happening to the incidence of dental disease. The appeal would not be enlightening simply because the group that regularly seeks dental care can in no way be assumed to be typical of the population at large.

The Use of Auxiliaries

The enhanced ability of the dentist to treat more patients reflects the changing nature of the dentist's practice and operation. As suggested, one of the most

[20]Canadian Dental Association, *Survey of Dentistry in Canada,* 1958, pp. 1-8.

important charges of the past decade or two is undoubtedly the increased reliance on various forms of auxiliaries — receptionists, assistants, hygienists and technicians; and on the "for hire" services of other professionals and technicians — accountants, commercial dental laboratories, messenger services. The increased productivity of the individual dentists reflects the participation of these individuals within the "industry". The possibility of a continuing adequate supply of auxiliary personnel and for hire services is of prime interest in examining the scope for continued increases in the productivity of the dental practice. Some of the discussion here overlaps the discussion of the nature of the practice in a subsequent chapter.

Table A12 suggests that approximately 90 per cent of all dentists have one or more full-time employees. This represents a positive gain of roughly 5 per cent since the 1963 survey, when 14.9 per cent were reported to have no full-time employees. The figures generated in the 1958 Canadian Dental Association Survey of Dental Practice on the percentage reporting no full-time employees suggest that the change between 1963 and 1966 is not necessarily indicative of a trend. The findings in 1958 were that 11.6 dentists were without full-time employees; the difference between this and the 1966 figure of 10.7 per cent is not significant.

One of the most noticeable comparisons to be drawn from the 1963 and 1966 data is the apparent shift from part-time to full-time employees. For all types of auxiliary personnel the percentage of dentists employing full-time personnel has increased. This is most marked in the case of the hygienists. The increase here may be due simply to the greater availability of this type of personnel.

In some ways the greater number of dentists hiring secretaries is a more interesting phenomenon. This figure increased by over 50 per cent between 1963 and 1966 — from 13.1 per cent to 21.7 per cent. The explanation is likely to be found in the growing complexities of operating a dental practice and in the somewhat larger size of the practice in terms of patients, sittings and the number of auxiliary personnel. The apparent increase in the use of secretary-receptionists would help explain the dentists' increased productivity over the same period.

If the secretary is an auxiliary who can enhance the productivity of the dentist (and there seems little reason to doubt that she is), then there is considerable room for further increases in the utilization of this type of personnel. Of all the personnel found in the dental office her skill levels are the lowest. Her period of training is very short and could take place on the job. Also, the cost of training is very low. These considerations, coupled with the fact that there is considerable opportunity to expand the numbers of secretary-receptionists, suggests that serious efforts should be made to persuade dentists to hire them.

In the general discussion of the need for auxiliary personnel, the secretary-receptionist is in grave danger of being overlooked. Fortunately, the figures suggest that the dentist in private practice is less likely to overlook her than those

outside the profession who have participated in the debate on the need for more or additional forms of auxiliaries. The opportunity to increase the utilization of secretaries is likely to continue for at least another decade. If it is the consensus of the policy-makers that a shortage in dental manpower exists, one of the most readily available forms of manpower should not be neglected.

The term "dental assistant" covers a wide variety of personnel. Indeed, in a great many practices the difference between the secretary-receptionist and the dental assistant is obscure. For the purposes of this study, the dental assistant is considered primarily a chairside assistant; however, her duties would typically extend to a great many other activities which are incidental but necessary to the smooth operation of a dental practice.

TABLE 5

Percentage of Dentists Employing Auxiliary Personnel by Type of Personnel, Ontario, 1963, 1967

	Hygienists		Technicians		Assistants		Secretaries	
Year	Full time	Part time	Full time	Part time	Full time	Part time	Full time	Part time
1963	1.7	4.1	2.4	2.9	82.0	20.0	13.1	10.5
1967	5.35	7.53	3.9	2.1	85.8	19.43	21.7	7.5

The percentage of dentists in Ontario with at least one dental assistant appears to be relatively constant. Approximately 80 per cent of all dentists in the province had at least one full-time dental assistant in 1963; this figure has risen to slightly over 85 per cent. Of the 13.8 per cent who do not have a full-time dental assistant, almost one-third, or approximately 5 per cent of all dentists, have part-time dental assistants. Only 8.9 per cent report that they employ no dental assistants, part time or full time.

The relatively high number that employ either a part-time or a full-time assistant suggests that there may be relatively little scope left for the more intensive use of this type of personnel. For a variety of reasons — such as the personality of the dentist, the size of the practice and its location — there will probably always be some dentists who prefer to practise without a chairside assistant. Whether 10 per cent represents the saturation point, beyond which further increases in the numbers of dentists employing dental assistants are unlikely, is problematical. Even if those currently not employing dental assistants were to do so, the effect on the supply of dental services would not be dramatic. Over the next decade, one might reasonably expect some increase in the extensive use of auxiliaries, perhaps even to the point where 95 per cent of the profession employ a dental assistant. The existence of dentists in semi-retirement, and of those just establishing themselves in private practice, will certainly account for at least 5 per cent who are unaided by auxiliaries.

The opportunity for the more effective use of dental assistants comes not in their more extensive use, but in their more intensive use. The predominant pattern today is one dentist, one dental assistant: 60 per cent of the dentists in the province employ one full-time dental assistant and no part-time assistants; a further 12 per cent employ one full-time assistant and additional part-time assistants. Consequently, 72 per cent are employing one full-time assistant. This is approximately the same as the 1963 percentage.

The pattern in the employment of dental assistants does seem to be changing quite dramatically, however. There is a rising number of dentists employing two or more dental assistants. In 1963 approximately 6.5 per cent of all dentists employed two or more dental assistants; in the short period between the two surveys this figure doubled, climbing to 13.9 per cent. Still, even with this dramatic increase in the past three years, the percentage of dentists in Ontario employing two or more dental assistants is roughly equal to the 1963 figure for British Columbia, 13.4 per cent; below that for Alberta, 18.9 per cent; and considerably below that for Saskatchewan, 25.6 per cent.

The rather rapid increase in the multiple employment of dental assistants, and the fact that Ontario has lagged behind some of the other provinces (notably Alberta and British Columbia, the two provinces which one might instinctively use as a basis for comparison) suggests that there may be a trend towards multiple employment of dental assistants that will continue for some years.

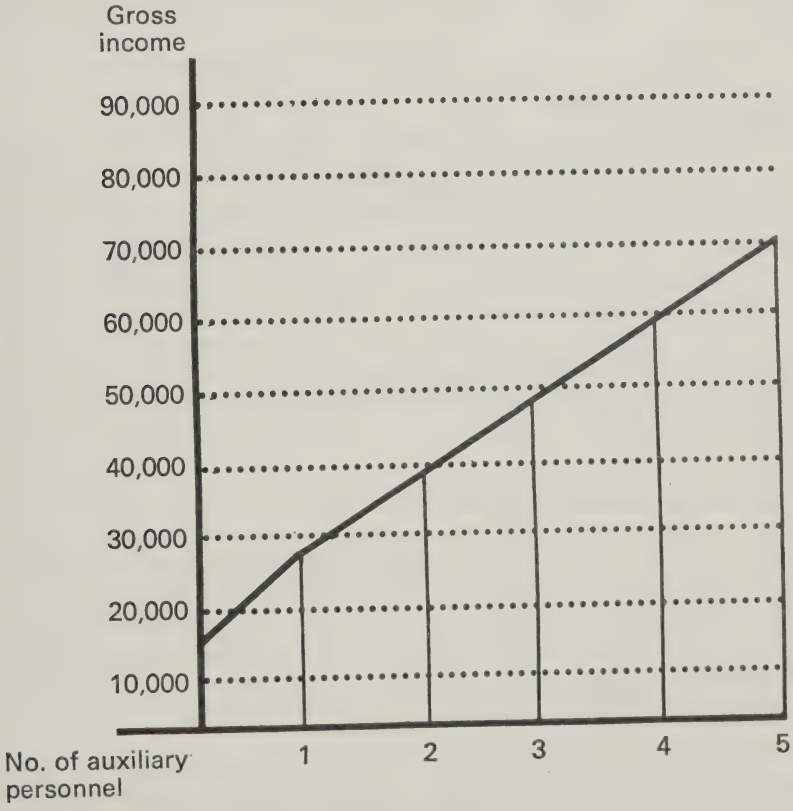
The apparent scope for an increase in the number of dental assistants is not without policy significance. If the technology of dentistry allows for real economies in the employment of more than two dental assistants, the supply of dental services could well be increased without an increase in the number of dentists. Here, as in the case of the secretary-receptionist, there seems to be considerable room for the exploitation of further economies of scale. The large increases in the productivity of dentists in the past decade, and the significant increase in the percentage employing secretaries and two or more dental assistants are probably not unrelated. It may be possible, as statistical sources grow, to discover the nature and extent of this relationship; but even without statistical verification some of the productivity of the profession can be reasonably attributed to the employment of these auxiliaries. If not, it would be very difficult to explain why more auxiliaries are being hired, and the manpower input of the dental practice expanded.

If auxiliaries are being successfully employed in some practices, it is difficult to see why they could not be successfully employed in others. The principal constraint on the employment of secretaries and multiple dental assistants is probably the size of the practice. The useful employment of auxiliaries normally would require some capital expansion — for example, an increase in the number of chairs and ancillary equipment. Relatively little additional capital would be required for the hiring of a secretary. Office space might have to be expanded, but usually this would represent an increase in current operating costs, not a

capital expenditure. Of course, dentists operating from their own homes may be prevented from building additions to their houses by local zoning by-laws. Or they might have to move to a larger home in order to expand their practices. In any case, a dentist is unlikely to have trouble financing this type of expansion. A lack of capital funds, therefore, would only rarely discourage the employment of auxiliary personnel.

The only reasonable limiting factor which would discourage the employment of auxiliary personnel is the size of the practice. One would expect that the larger the number of patients seen per year, the higher the gross income per year and the larger the number of auxiliary personnel. This expectation is borne out by the evidence of Table A8(b). The relationship between the size of the practice and the number of auxiliary personnel is clearly spelled out in the evident tendency for gross income to increase rapidly with the number of auxiliaries. This is depicted in Figure 1.

Figure 1. Number of auxiliary personnel and gross income of practice, Ontario, 1966

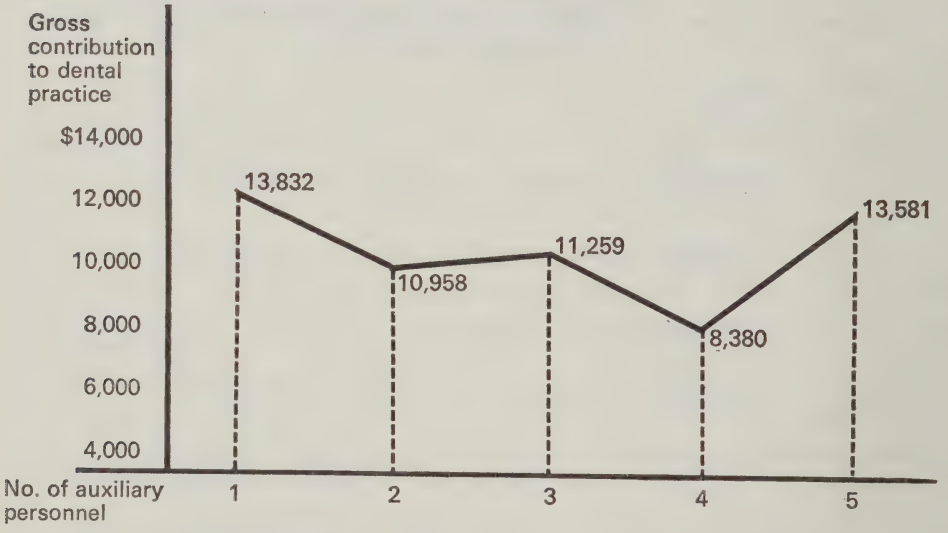


SOURCE: Survey of Dental Practice in Ontario, 1966.

The relationship is remarkably strong and constant. Insofar as it provides a clue to the productivity of the auxiliary, it suggests that her marginal productivity is constant, or perhaps even positive, up to and including five auxiliaries. This has considerable significance because it suggests that very intensive use of auxiliaries does not result in diminishing marginal returns to the practice. In other words, the effectiveness of auxiliaries is not fully realized, apparently, by the hiring of any number less than five, and indeed the number of auxiliaries that can be gainfully employed within a private practice may exceed five.

The second remarkable feature of the relationship between gross income and what may be called the marginal contribution of the auxiliary to the dental practice is presented in Figure 2.

Figure 2. Gross contribution of auxiliary personnel to dental practice, Ontario, 1966

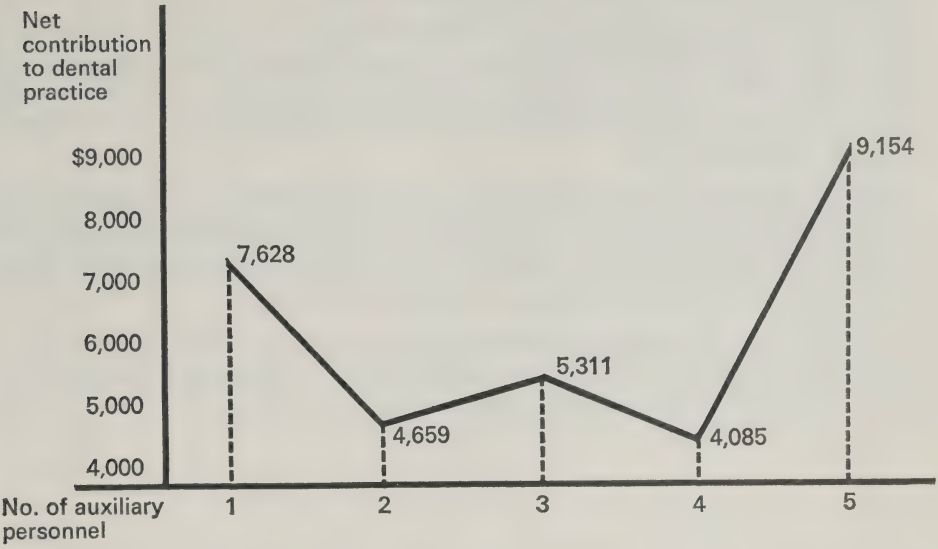


SOURCE: Survey of Dental Practice in Ontario, 1966.

It will be noted that the marginal contribution of the auxiliary to the practice is greatest when the first auxiliary is hired, and then declines somewhat. This decline over the second, third and fourth auxiliary hired, however, is both erratic and not as sharp as one might intuitively have expected. The most surprising result is that the marginal contribution of the fifth auxiliary is positive and nearly as high as that of the first.

These results must be interpreted carefully. The dramatic positive contribution of the fifth auxiliary to the practice must be due in some cases to dentists employing other dentists, and regarding them as the "fifth" auxiliary. One's suspicions

Figure 3. Net contribution of auxiliary personnel to dental practice, Ontario, 1966



SOURCE: Survey of Dental Practice in Ontario, 1966.

are aroused even more by the fifth auxiliary when the net marginal contribution to the practice is examined. This is presented in Figure 3.

The pattern of the marginal net contribution of the auxiliaries is very similar to the pattern of their marginal gross contribution to the practice. A comparison of Figures 2 and 3 shows that the difference between the marginal net and the marginal gross contribution of the fifth auxiliary is only slightly more than $4,000. If the fifth auxiliary were actually the second dentist in a practice, one would expect the net contribution to the practice (that is, to the employing dentist) to be somewhat lower than $9,154, simply because of the relatively higher salary commanded by the employed dentist relative to the other "auxiliaries". In fact, the difference between the marginal net and the marginal gross contribution for all auxiliaries is fairly constant. Why the fifth auxiliary should have such a high marginal net contribution to the practice is an unexplained mystery; however, it is a mystery that one may feel benign about.

In the preceding pages, the internal structure of the private practice has been studied; this subject is dealt with more extensively in Chapter 4. It has been examined here also to help determine whether an increase in dental services could be achieved by increasing the utilization of auxiliary personnel.

It appears that there remains considerable scope for the further employment of secretaries and that the profession is currently hiring more of this type of personnel. Also, it appears that if significantly greater numbers of dental assistants

are to be employed, they will have to be absorbed into practices which already contain one or more dental assistants. The question is, then, whether this is likely to happen and if it does, whether it will increase significantly the supply of dental services. Our answer to both parts of this question is "yes". The profession in Ontario has not made as intensive use of the second dental assistant as is common elsewhere. This suggests that although the percentage of practices containing more than one dental assistant is growing, there may be some "catching up" to be done in Ontario.

It remains, therefore, to determine how far multiple hiring of dental assistants can be carried. An examination of the impact of the auxiliary on the productivity of the practice leads to the conclusion that under favourable conditions the typical practice could be expanded to contain at least five auxiliaries.

Even allowing for part-time equivalents, not more than one or 2 per cent of the practices in the province contain this number of auxiliaries. In short, the effective utilization of auxiliaries by dentists has scarcely begun.

Chapter 3 The Geographic Distribution of Dentists in Ontario

Most authorities or authors, when commenting on the distribution of dentists in Ontario, do so in disparaging and sometimes discouraged terms. The assumption that dentists are poorly distributed is almost universal.[1] Indeed it is one of the few problems that is "officially" recognized.

To ameliorate the problem, there is a scholarship or bursary scheme, the conditions of which require the recipient to practise for one year in a community chosen from a list which contains those areas most in need of dental service. The hope, of course, is that the young dentist will continue to live in the community once his compulsory year is over.

Efforts are being made to increase the number of dentists in rural Ontario. Evidence accumulated in the past suggests that those from rural areas are most likely to return to set up practice in small towns or "in the country".[2] This knowledge has spurred efforts to increase the number of dental students with a rural or small-town background.

This chapter will examine whether these efforts are warranted and, if so, whether they should be intensified. The question is legitimate simply because no published study has demonstrated a geographic maldistribution of dentists in which rural Ontario is the disadvantaged party.

The assumption that a maldistribution exists appears to rest primarily on the population:dentist ratio. This figure, as already demonstrated, is not sufficient

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[1]This attitude is well expressed in a brief submited to the Committee on the Healing Arts by the Royal College of Dental Surgeons:

> Many statements have been made and written relative to a shortage of dentists. The shortage so frequently described is an exaggeration, the truth being that it is more a problem of distribution than of shortages.

Royal College of Dental Surgeons of Ontario, Supplementary Brief to the Committee on the Healing Arts, December 1966, p. 6.

During the proceedings before the Committee, Dean Dunn put the matter somewhat differently:

> I think the lack of dentists in certain areas of the province probably has been overstated, but I still think we have a serious problem in other places in this province . . . .

So it would be quite wrong to say we don't have a problem in terms of numbers but it is certainly aggravated by this inequality of distribution.

[2]B. A. McFarlane, *Dental Manpower in Canada,* Royal Commission on Health Services, Queen's Printer, Ottawa, 1964, Chapter 5.

TABLE 6
Distribution of Dentists in Ontario

County	Total population 1966	No. of dentists 1967	Population: dentist ratio	No. of dentists 65 and over 1967	No. of effective dentists 1967	Population: effective dentists ratio
Algoma	113,561	31	3,633.3	6	28.0	4,055.8
Brant*	90,945	29	3,136.0	11	23.5	3,870.0
Bruce*N	43,085	12	3,590.4	5	9.5	4,535.3
Carleton	407,463	192	2,122.2	27	178.5	2,282.7
CochraneN	97,334	19	5,122.8	4	17.0	5,725.5
Dufferin*	17,108	8	2,138.5	5	5.5	3,110.5
Dundas	17,106	4	4,276.5	3	2.5	6,842.4
Durham	44,549	11	4,049.9	2	10.0	4,454.9
Elgin	61,912	20	3,095.6	7	16.5	3,752.2
Essex†	280,922	84	3,344.3	23	71.5	3,929.0
Frontenac*	97,138	44	2,207.7	6	41.0	2,369.2
Glengarry	18,181	1	18,181.0	0	1.0	18,181.0
Grenville	23,429	6	3,904.8	2	5.0	4,685.8
GreyN	62,592	23	2,721.4	7	19.5	3,209.8
Haldimand*	30,020	7	4,288.6	4	5.0	6,004.0
Haliburton*N	7,768	1	7,768.0	0	1.0	7,768.0
Halton	140,800	62	2,271.0	7	58.5	2,406.8
Hastings	94,127	27	3,486.2	0	27.0	3,486.2
Huron*	54,446	16	3,402.9	3	14.5	3,754.9
Kenora	53,995	13	4,153.5	2	12.0	4,499.6
Kent	96,406	26	3,707.9	9	21.5	4,484.0
Lambton	108,236	31	3,491.5	5	28.5	3,797.8
Lanark	41,212	12	3,434.3	5	9.5	4,338.1
Leeds	49,129	20	2,456.5	7	16.5	2,977.5
Lennox and Addington*	25,202	1	25,202.0	0	1.0	25,202.0
Lincoln	146,099	57	2,563.1	6	54.0	2,705.5
Manitoulin*N	10,544	2	5,272.0	1	1.5	703.6
Middlesex†	249,403	112	2,226.8	16	104.0	2,398.1
Muskoka*N	27,691	11	2,517.4	3	9.5	2,914.8
Nipissing	73,533	24	3,063.9	2	23.0	3,197.1
Norfolk*	50,578	14	3,612.7	1	13.5	3,746.5
Northumberland	45,074	8	5,634.3	1	7.5	6,009.9
Ontario†	170,818	44	3,882.2	4	42.0	4,067.1
Oxford	76,018	25	3,040.7	2	24.0	3,167.4
Parry Sound*N	28,335	6	4,722.5	2	5.0	5,667.0
Peel†	172,321	57	3,023.2	4	55.0	3,133.1
Perth	60,424	16	3,776.5	4	14.0	4,316.0
Peterborough†	81,959	33	2,483.6	4	31.0	2,643.8
Prescott*	27,155	3	9,051.7	1	2.5	10,862.0
Prince Edward*	21,307	3	7,102.3	0	3.0	7,102.3
Rainy RiverN	25,816	4	6,454.0	0	4.0	6,454.0
RenfrewN	89,453	24	3,727.2	5	21.5	4,160.6
Russell	21,107	—	—	—	—	—
Simcoe	149,132	52	2,867.9	3	49.0	3,043.5
Stormont†	59,550	16	3,721.9	8	12.0	4,962.5
Sudbury	174,102	36	4,836.2	4	34.0	5,120.6
Thunder Bay	143,673	45	3,192.7	5	42.5	3,380.5
Timiskaming*N	47,154	9	5,239.3	1	8.5	5,547.5
Victoria	30,917	7	4,416.7	0	7.0	4,416.7
Waterloo†	216,728	90	2,408.1	14	83.0	2,611.2
Welland†	178,818	49	3,649.3	11	43.5	4,119.8
Wellington	94,177	33	2,853.8	4	31.0	3,038.0
Wentworth†	394,299	164	2,404.3	30	149.0	2,646.3
York†	2,018,019	1,175	1,717.5	155	1,097.5	1,838.7

NSelected Rural Group. (See page 00.)
*Rural county.
†Urban county.

evidence for such a conclusion; a great many other conditions and qualifications must be fulfilled before the ratio could be interpreted as an index of a shortage. Having reiterated our caution, we may turn to the "evidence" of the population:dentist ratios. This is presented in Table 6.

The Urban-Rural Split

For statistical reasons, it has been necessary to use the counties of Ontario as the geographic units on which to base the study of distribution. Clearly, this is not entirely satisfactory. The urban-rural split varies widely from one county to another. Thus, a maldistribution of dentists could occur within a county, although the figures for the county might suggest that it is "adequately" serviced. A toothache, like a great many other things, is apt to show little respect for man-made boundaries. Undoubtedly, there are toothaches in Caledon Township in Peel County that find relief in Toronto, which is included here in York County. Presently, however, there is no way to account for these migrants except to examine specific cases and judge whether the figures for one county are depressed because of the proximity of a large town in another county. To some extent, this problem can be mitigated by focusing attention on those counties which can be classed as predominately urban and predominately rural.

If a county is 75 per cent urban, it will be classed as predominately urban; similarly, if it is 75 per cent rural, it will be classed as rural. The urban-rural split on which the counties have been chosen is that used in *Ontario: An Economic Survey*.[3] In Table 6 those counties marked with an asterisk (*) are rural and those marked with a sword(†) are urban.

The results of this comparison are presented graphically in Figure 4. There is clearly a divergence of the population:dentist ratio for the predominately urban and the predominately rural counties. The inference, if an inference is to be drawn from these figures, is that the rural counties are less "adequately" serviced. To place this inference on more solid grounds, it is possible to meet some of the conditions which make a comparison of the population:dentist ratio valid. (See Chapter 2.)

The first step that we may take towards making the population:dentist ratio a better guide to the actual physical distribution of dental services or resources is a matter of commonsense. First, dentists, for a variety of reasons, cannot be regarded as a homogeneous unit. Statisticians, like grade school teachers, prefer to add apples to apples rather than apples to oranges. Treating one dentist as the full equivalent of another is something like adding apples to oranges; in the case of the apples and oranges the result may be fruit salad, but in the case of the dentists the result is a mess, and is apt to be very misleading. Unfortunately, the choice of suitable adjustments that can be made is limited. Whatever adjustments

[3]*Ontario: An Economic Survey.*

we attempt, some elements of the mess will continue to haunt us. Furthermore, the methods of adjusting the figures are partially arbitrary, but it is hoped that they will appeal to the not too rigorous application of commonsense. Such is the stuff that manpower studies are made of!

Number of Effective Dentists

Rather than use the number of dentists recorded on the RCDS registration, it is desirable to determine the effective number of dentists actually practising in each county. In general terms, the only groups of dentists which may require adjusting are either the very young or the elderly. The young dentist is apt to be less productive than his typical confrere because his practice is less developed. It is evident from Table A21(c) that dentists under twenty-five years of age are the least "overworked" group in the profession. This is confirmed by the evidence presented in Table A18 (c) which indicates the significantly lighter patient load of this group. This merely suggests, however, that it takes time to get established and, as both tables indicate, this time period is apt to be rather short. In adjusting for the young dentists in the sample, one would be taking account principally of the fact that they are underutilized. They may be also physically less skilled in some respects, but they would undoubtedly make up for this in enthusiasm and a tendency to work either longer weeks or more weeks in the year. At any rate, they appear to represent the typical dentist in that they are able and, one presumes, willing to work both as hard and as long as any other member of the profession. This is not true of the age group at the other extreme.

The older age group consists of dentists sixty-five years and over. The first problem with these gentlemen is that some have retired and yet remain registered. What proportion of those over sixty-five are not practising is not known. The figures of the last chapter suggested that at least 10 per cent of those on the register likely are not in practice; a fairly large proportion of these probably are in the sixty-five years and older age group. This leaves a large number of unknown factors to which more will be added.

The figures in Table A18 (c) show that after the age of sixty the number of patients per dentist falls sharply. This may be a reflection of two factors — lower productivity on the part of the age group, and underutilization resulting from patient reluctance to be treated by senior members of the profession. The latter does not seem to be the case. Again Table A21 (c) sheds a little light. Although those between the ages of seventy and seventy-five (2.9 per cent of the sample; see Table A6(c)) displayed some impatience at the relaxed pace of their practices, those between the ages of sixty and sixty-nine appear to be well satisfied with the "busyness" of their practices. There is little justification, therefore, for believing that they are involuntarily underutilized.

The dentist over sixty-five works fewer weeks in the year: forty-four weeks, compared with the forty-seven weeks worked by those in their thirties and the

forty-six weeks of those in their forties and fifties. His week also is somewhat shorter. Those between sixty-five and sixty-nine work slightly more than forty-three hours a week; this falls to thirty-three and one-half hours for the seventy to seventy-four group. For illustrative purposes, it may be pointed out that the forty to forty-four age group works 1,880 hours per year compared with 1,660 hours of the sixty-five to sixty-nine age group. They work 12 per cent fewer hours, therefore, than the younger age group. This figure, it must be remembered, accounts only for those in active practice; it does not take into account those who remain on the register but have, in fact, retired.

The effective number of dentists does not radically alter the ratio for the predominately urban counties. Typically, it results in an increase of roughly 200, with Stormont showing the most pronounced increase, just over 1,200. Stormont also shows the highest proportion of dentists in the sixty-five years and over group, a full 50 per cent compared with under 10 per cent for York.

The pattern among the predominately rural counties is dramatically different. Dufferin, which appeared to have the best population:dentist ratio, leaps from 2,138 to a population:effective dentist ratio of 3,110. Of the eight dentists in that county, five are over the age of sixty-five. Ignoring those counties in which the population:dentist ratio is disturbingly high and those in which there is only one dentist, the remaining counties (Bruce, Dufferin, Haldimand, Huron, Manitoulin, Muskoka, Parry Sound and Timiskaming) show a varied pattern. At the other extreme of the 30 per cent leap of Dufferin is a very mild increase in Norfolk from 3,612 to 3,746. This increase of 134 compares favourably with the increase in York (the lowest among the urban counties) of 121. The largest absolute increase occurs in Haldimand where the ratio jumped from 4,288 to 6,004.

Range of Ratios

The message of the population:effective dentist ratio is contained in a comparison of the predominately urban group with the predominately rural group. The range of ratios in the predominately rural group is very large, from a low of 2,914 in Muskoka to a high of 25,202 in Lennox and Addington; the median county is Haldimand with an adjusted ratio of 6,004. The range of ratios for the predominately urban counties is much more compressed; Wentworth with an adjusted ratio of 2,646 is the lower boundary of the median class. The median for the urban counties, therefore, is appreciably less than half that for the predominately rural.

It is difficult to generalize about the regional distribution in the province as a whole. A pattern starts to emerge only when attention is concentrated on those counties that are either decidedly urban or decidedly rural. For example, the median population:dentist ratio for the province occurs between that for Algoma at 4,055 and that for Ontario at 4,067. These figures are well above the median for the predominately urban and well below those for the predominately rural.

Interestingly enough, there are counties in both groups which are on the "wrong side" of the provincial median. For example, Stormont, Welland and Ontario — all urban counties — are above the provincial median while among the predominately rural counties, Muskoka, Dufferin and Norfolk are below the provincial median with Huron forming the lower boundary of the median class. Indeed, there is a surprising number of the predominately rural counties on the wrong side of the provincial median. Taken alone, this might suggest that there are other factors besides the urban-rural split that affect the distribution of dentists. This would hardly be surprising. The predominately rural counties, however, do appear to be fairly representative of the lower extreme.

Population:Dentist Ratios by County

The selection of counties on the basis of the urban-rural split placed fifteen counties in the predominately rural category. If the fifteen counties with the poorest population:effective dentist ratio had been chosen, nine of the counties in the original group would have remained in the new group. The six new counties are Cochrane, Prescott, Sudbury, Timiskaming, Northumberland and Rainy River; the highest urban-rural spit, 73.7 per cent urban, is found in Sudbury. Of these four counties, three — Cochrane, Rainy River and Timiskaming — are in the northerly reaches of the province. Cochrane is a vast area with two major centres of population — Kapuskasing and Timmins. The population:dentist ratio for both these centres is less than the provincial median. The wide dispersion of the remaining population explains the high population:effective dentist ratio for the county.

Prescott and Northumberland, while not northerly, can be explained in terms of their location. The town of Trenton lies on the east boundary of Northumberland and the larger centre of Belleville is within an hour's drive of much of the county. Both these towns are in the county of Hastings and both have population:dentist ratios of less than 2,000. To the north of Northumberland, and again within easy commuting distance of the county, is the city of Peterborough in the county of Peterborough. The city of Peterborough has a population:dentist ratio of less than 1,800. To the immediate west of Northumberland is the town of Port Hope in the county of Durham. Port Hope has a population:dentist ratio of approximately 1,650, very low indeed. The location of Northumberland county suggests that much of its rural population is likely to find its dental services in neighbouring counties.

What is true of Northumberland is true also of Prescott. Much of this county is within forty miles (as the crow flies) of Cornwall and Ottawa. Undoubtedly, many of the residents of this county travel to one of these centres for their dental services.

Both Northumberland and Prescott indicate the danger of using the county as the basic geographic unit for analysis. In our sample of predominately rural counties, either are probably serviced by larger centres in adjoining counties. Both

Norfolk and Haldimand lie within an hour's drive of one or more of one of the following: Welland, Hamilton, Brantford, Woodstock, London and St. Thomas. Prince Edward may be readily serviced by both Trenton and Belleville; Dundas by Cornwall, Ottawa and Brockville. Much of Lennox and Addington is within easy reach of Belleville and Kingston; all parts of Russell are within forty miles of Ottawa; Cornwall is on the boundary of Glengarry; all of Grenville is but an hour's drive from Ottawa or Brockville. Ranking the predominately rural counties from 1 to 15, these eight counties occupy positions 3, 6, 8, 9, 11, 13, 14, and 15. The fact that they tend to have much poorer population:dentist ratios, coupled with their position in the southern part of the province, suggests that the figures for these counties are indeed influenced by their proximity to larger centres in adjoining counties.

If these eight counties were eliminated from the study sample, the median of the predominately rural would fall on Bruce with a ratio of 3,590. This is still well above the ratio for the predominately urban; but it must be remembered that the predominately urban counties service some of the counties which were dropped from the predominately rural category. Carleton, Frontenac, Wentworth, Middlesex and Stormont all have been presumed to service these counties. If it were possible to adjust for the area that these counties service, as opposed to the population within their boundaries, the effective ratio for the predominately urban would rise.

Selected Rural Group and the Influence of Urbanization

A selection of counties which do not contain major concentrations of population, and which are not in the immediate vicinity of such a concentration, shows a pattern similar to that indicated by the predominately rural. A good working group which meets these conditions would be Cochrane, Grey, Rainy River, Renfrew which are not in the sample of predominately rural, and Bruce, Haliburton, Manitoulin, Muskoka, Parry Sound, and Timiskaming which are. It should be noted that many of the northerly counties must be excluded because of the very high urban-rural splits found in them. Algoma and Thunder Bay are classed as urban counties.

The group of ten rural counties listed above will be referred to as the "selected rural group". These counties are rural in character and sufficiently removed from urban centres in other counties to be assumed to be beyond the "service area" of another county. They have been marked with an "N" in Table 6. In this group of ten the median falls between Bruce, with an adjusted ratio of 4,535, and Timiskaming, with a ratio of 5,547. The highest ratio in the group is that for Haliburton, 7,768. The median for this group is considerably higher than that for the predominately urban group (2,646); lower than that for the predominately rural group (6,004); and higher than the provincial median (4,055-4,067).

The pattern which emerges from this analysis is blurred. However, if there is indeed a maldistribution of dentists and if it is to the disadvantage of the rural

parts of the province, one might expect a certain pattern to become evident from the comparison of different groups. One would expect the population:dentist ratio to rise as one moved from the urban to the rural counties. To some extent this is the case; the one peculiarity of the data is that the median for the selected rural group is higher than that for the reduced predominately rural group. This is peculiar, because the selected rural group contains counties with a greater degree of urbanization than does the reduced predominately rural group. Indeed, the median for those counties in the selected rural group, which are not in the reduced rural group, is higher than the median for the reduced rural group. This is an important comparison because only here has the influence of a major centre in a neighbouring county been eliminated or very greatly reduced. In counties with a greater degree of urbanization, however, the population:dentist ratios are not significantly better. Significant improvement in the ratio occurs only in counties with a very high degree of urbanization. This is the group of predominately urban counties, those which contain major towns and cities; indeed none of these counties contains cities of less than 40,000 population and many contain cities significantly larger than this. The important variable in the determination of the location of dentists seems to be city size, rather than a simple index of the degree of urbanization.

The scatter diagram (Figure 4), which relates the degree of urbanization to the population:dentist ratio, suggests that for the majority of counties which do not show extremes of urbanization, there is little relationship between urbanization and the population:dentist ratio. Since the scatter diagram as a whole may suggest a pattern to some readers, we should perhaps caution against seeing too much in this figure; it conceals the fact that counties are not independent homogeneous units, a factor we have tried to correct for by focusing attention upon the selected group of rural counties. This factor should be kept in mind also when studying the results of the regression analysis in Appendix I.

The apparent breakdown of a simple relationship between the degree of urbanization and the adjusted population:dentist ratio may mean that there are other factors which explain the distribution of dentists. The significance of city size goes beyond arguments that relate simply to the degree of urbanization. From the results of simple regression analysis, it does appear that the degree of urbanization can explain approximately 40 per cent of the variance in the distribution of dentists.

Average Per Capita Income

This variable loses its explanatory value, however, when the regression equation contains average per capita income as an independent variable. There exists a high degree of collinearity between the degree of urbanization and average per capita income. For the non-technically minded reader, this simply means that there exists a correlation between the degree of urbanization and the average per capita income. (Technically minded readers may feel more comfortable turning

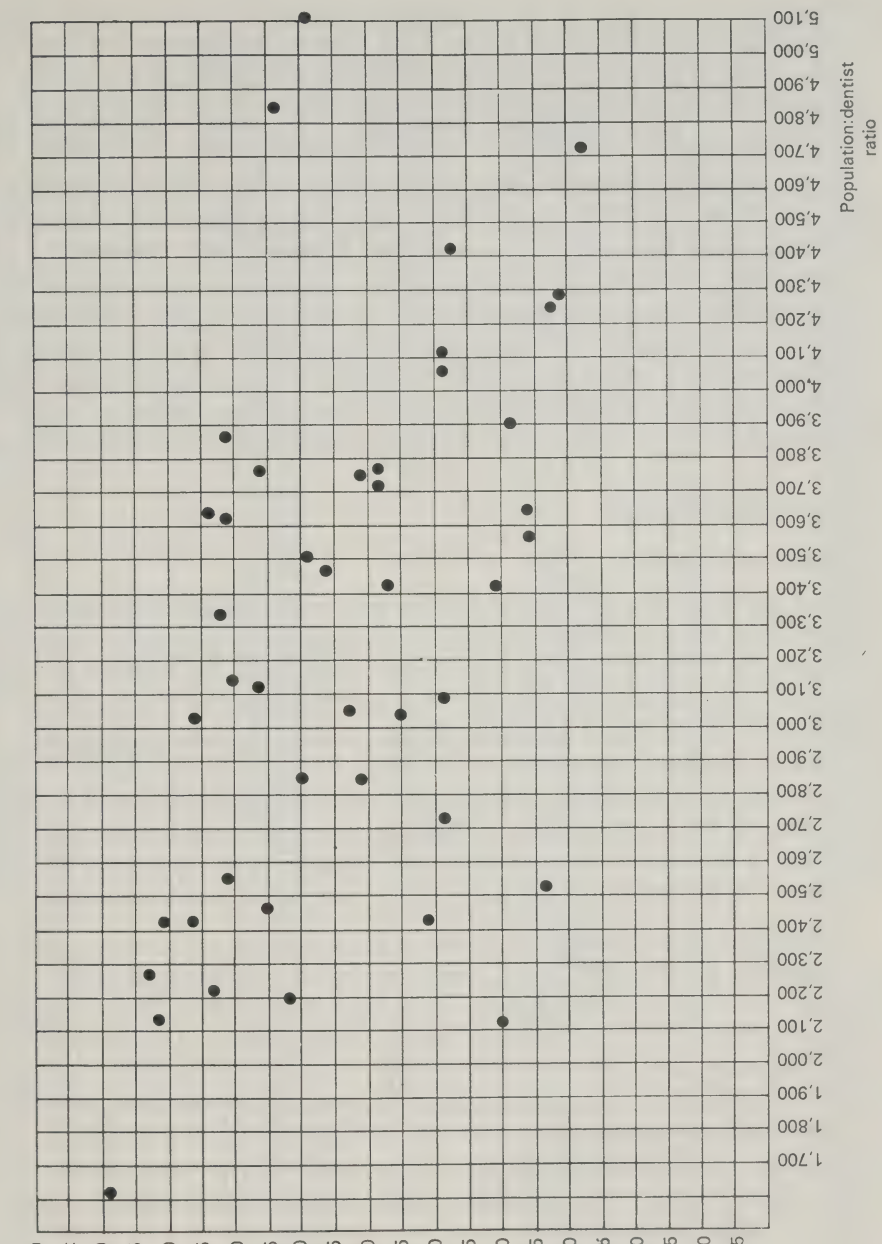

Figure 4. Degree of urbanization and population:dentist ratio

directly to the summary of the regression results.) The fact that the degree of urbanization loses explanatory value when seen in conjunction with average per capita income suggests that the relationship, to the extent that it exists, is best explained in terms of some objective characteristic of the particular county. In this context, the most important characteristic of the county is per capita income.

This implies that dentists shun lower income areas, not rural areas as such. This has many important ramifications, even though the rural areas tend to be the low income areas. For those who like definite, clear conclusions, we may overstate the results of our analysis so far. We find no conclusive evidence to suggest that the degree of urbanization is an important factor in determining the distribution of dentists; this conclusion is based partly on the evidence of the regression analysis and partly upon the study of the rural counties where the results were particularly inconclusive. Now, there are a number of other factors which must be taken into account in the comparison of population:dentist ratios.

Nature of the Practice

Incidence of Hygienists

One of the important conditions for the valid comparison of population:dentist ratios is that the nature of the practices be similar. Of paramount importance is the similarity of the personnel mix. Table 7 sets forth the number of hygienists by county, the population:hygienist ratio and the hygienist:dentist ratio. To say that there is a paucity of hygienists in the rural areas is more than mild understatement. Of those registered and currently living in the province 54 per cent are in York, the most urban of all counties. Not surprisingly, York has the lowest population:hygienist ratio. Characteristically, this ratio is highest for rural counties; one-third of all counties have no hygienists and all of these are rural. Timiskaming with its veritable bonanza of hygienists is something of an aberration.

Somewhat more revealing in terms of the nature of the practice, however, is the hygienist:dentist ratio. Again, laying aside the embarrassing riches of Timiskaming, the most favourable ratio is to be found in the urban counties. The impressive figure for Prince Edward county is due not to an abundance of hygienists but to a paucity of dentists. Generally, where the population:dentist ratio is low, the hygienist:dentist ratio is high. This is true for the predominately urban and the predominately rural counties. We are thus able to reach a conclusion of some significance. The productivity of the rural practice is likely to be lower than that of the urban practice. This conclusion tends to reinforce the inference made from the population:dentist ratios.

Incidence of Specialists

Characteristics of the regional distribution of specialists are presented in Table 8. The results are hardly surprising. There are virtually no specialists outside the predominately urban counties; indeed, 60 per cent of all specialists are found in

TABLE 7
Distribution of Hygienists in Ontario

County	Total population 1966	No. of hygienists 1967	Population: hygienist ratio	No. of dentists 1967	Hygienist: dentist ratio
Algoma	113,561	1	113,561.0	31	0.03
Brant	90,945	3	30,315.0	29	0.10
Bruce	43,085	0	—	12	0.00
Carleton	407,463	6	67,910.5	192	0.03
Cochrane	97,334	2	48,667.0	19	0.11
Dufferin	17,108	3	5,702.7	8	0.38
Dundas	17,106	0	—	4	0.00
Durham	44,549	0	—	11	0.00
Elgin	61,912	1	61,912.0	20	0.05
Essex	280,922	5	56,184.4	84	0.06
Frontenac	97,138	3	32,379.3	44	0.07
Glengarry	18,181	0	—	1	0.00
Grenville	23,429	0	—	6	0.00
Grey	62,592	0	—	23	0.00
Haldimand	30,020	0	—	7	0.00
Haliburton	7,768	0	—	1	0.00
Halton	140,800	8	17,600.0	62	0.13
Hastings	94,127	2	47,063.5	27	0.07
Huron	54,446	0	—	16	0.00
Kenora	53,995	1	53,995.0	13	0.08
Kent	96,406	0	—	26	0.00
Lambton	108,236	2	54,118.0	31	0.06
Lanark	41,212	1	41,212.0	12	0.08
Leeds	49,129	0	—	20	0.00
Lennox and Addington	25,202	0	—	1	0.00
Lincoln	146,099	4	36,524.8	57	0.07
Manitoulin	10,544	0	—	2	0.00
Middlesex	249,403	6	41,567.2	112	0.05
Muskoka	27,691	1	27,691.0	11	0.09
Nipissing	73,533	0	—	24	0.00
Norfolk	50,578	1	50,578.0	14	0.07
Northumberland	45,074	1	45,074.0	8	0.13
Ontario	170,818	6	28,469.7	44	0.14
Oxford	76,018	1	76,018.0	25	0.04
Parry Sound	28,335	1	28,335.0	6	0.17
Peel	172,321	5	34,464.2	57	0.09
Perth	60,424	1	60,424.0	16	0.06
Peterborough	81,959	3	27,319.7	33	0.09
Prescott	27,155	0	—	3	0.00
Prince Edward	21,307	1	21,307.0	3	0.33
Rainy River	25,816	0	—	4	0.00
Renfrew	89,453	1	89,453.0	24	0.04
Russell	21,107	0	—	—	0.00
Simcoe	149,132	3	49,710.7	52	0.06
Stormont	59,550	1	59,550.0	16	0.06
Sudbury	174,102	2	87,051.0	36	0.06
Thunder Bay	143,673	2	71,836.5	45	0.04
Timiskaming	47,154	2	23,577.0	9	0.22
Victoria	30,917	0	—	7	0.00
Waterloo	216,728	12	18,060.7	90	0.13
Welland	178,818	2	89,409.0	49	0.04
Wellington	94,177	3	31,392.3	33	0.09
Wentworth	394,299	12	32,858.3	164	0.07
York	2,018,019	150	13,453.5	1,175	0.13
Out of Province		15			

TABLE 8

Distribution of Specialists in Ontario

County	Total no. of specialists 1967	Total population 1966	Specialist: population ratio	Total no. of dentists 1967	Specialist: dentist ratio
Algoma	1	113,561	.000009	31	.0323
Brant	1	90,945	.000011	29	.0345
Bruce					
Carleton	18	407,463	.000044	192	.0938
Cochrane					
Dufferin					
Dundas					
Durham					
Elgin					
Essex	4	280,922	.000014	84	.0476
Frontenac	2	97,138	.000021	44	.0455
Glengarry					
Grenville					
Grey					
Haldimand					
Haliburton					
Halton	2	140,800	.000014	62	.0323
Hastings					
Huron					
Kenora					
Kent					
Lambton	1	108,236	.000092	31	.0323
Lanark					
Leeds					
Lennox and Addington					
Lincoln	4	146,099	.000027	57	.7018
Manitoulin					
Middlesex	8	249,403	.000032	112	.0714
Muskoka					
Nipissing					
Norfolk					
Northumberland					
Ontario	1	170,818	.000006	44	.0227
Oxford					
Parry Sound					
Peel	1	172,321	.000006	57	.0175
Perth					
Peterborough	1	81,959	.000012	33	.0303
Prescott					
Prince Edward					
Rainy River					
Renfrew					
Russell					
Simcoe	1	149,132	.000007	52	.0192
Stormont					
Sudbury	2	174,102	.000012	36	.0556
Thunder Bay					
Timiskaming					
Victoria					
Waterloo	6	216,728	.000028	90	.0667
Welland	2	178,818	.000011	49	.0408
Wellington	1	94,177	.000011	33	.0303
Wentworth	13	394,299	.000033	164	.0793
York	104	2,018,019	.000052	1,175	.0885

SOURCES: DBS, Census of Ontario, 1966; RCDS Directory, June 1967; RCDS Print-Out Sheets, 1967.

York county. Clearly when a specialist is not available, specialist treatment cannot be given. There are vast areas in Ontario in which the services of dental specialists are not available. This does not mean that the population of these regions is without the services offered by specialists. In the typical case, the local dentist will attempt to fill the vacuum when the need arises. Notwithstanding his efforts, however, there is a range of services that should be undertaken only by a specialist; these are not available to rural and sometimes not-so-rural populations. Before concluding that more specialists should be shipped to the country, however, it may be worthwhile asking if a population:specialist ratio of 20,000:1 in York is "adequate". Again, for population:dentist ratios to be validly compared there must exist close similarity in the nature of the practice. For example, if dentists in the rural areas hired more auxiliary personnel, used more chairs, charged higher fees, and worked more weeks and longer hours, one might conclude, in spite of the population:dentist ratio, that dental service was more readily available in rural areas. Therefore, we shall attempt to discover whether there are regional differences in the nature of dental practice in Ontario, and whether something about the relative abundance of dental services can be inferred from these differences.

Busyness of the Practice

Population:Dentists' Hours Ratio

Obviously, the population:dentist ratio is not a reliable index of the "supply" of dentists. One could immediately improve on this figure by calculating the population:dentists' hours ratio. This would account for any differences in the annual number of dentists who worked per year by location. Table A15(a) presents the average number of hours worked by each dentist in each county. The lowest average number of hours worked per year which has statistical significance occurs in Bruce. The reported average here is 1,455. Among the highest figures reported are Northumberland and Peel with 2,044 and 2,135, respectively. The county reporting the highest figure in the province is Victoria with an average of 2,518; this figure, however, is based on the returns of only three of the seven dentists in the county. It is so far above norm that it must be suspect.

Since dentists themselves are inclined to be uncertain as to the actual number of hours they work, it is probably wise to interpret these figures in well-rounded terms. A reasonable estimate of the range, therefore, would probably be 1,500 to 2,100 hours per year. Using 1,500 hours as the base, there exists a 40 per cent difference between the average minimum number of hours figure and the average maximum figure. This represents a very considerable range. The provincial average is 1,860 and the provincial median is 1,884. The predominately urban group has a range of slightly less than 300, from a low in Frontenac of 1,662 to a high in Welland of 1,949; the median is 1,862.

Because of the small number of dentists in some rural counties and the even smaller number of replies, the data for the average number of hours worked

per year in some counties is unreliable. Among the selected rural group, only eleven counties offer dependable data.[4] The range of the average number of hours worked is even more striking than proved to be the case for the urban counties.

The fact that rural dentists appear to work a somewhat shorter year than their urban counterparts could be caused by their services being less in demand; or by their wishing to work less. They may wish to escape to the city more frequently or spend an extra week in Florida. From Table A14, it is possible to compare the number of weeks worked by the two study groups. For the predominately urban group, the average year contains 46.2 work weeks; the median falls between 46.2 and 46.6. The average number of weeks worked is lower for the rural group, 44.9; the median also shows a slight downward bias. This would suggest that the rural dentist does, in fact, spend a little more time in Florida than does the urban dentist.

The number of hours worked per week is very nearly similar. The rural dentist works just under half an hour a week less than the urban dentist — 39.48 hours compared to 39.93 hours. Because of the nature of the data, little importance should be attached to these figures; the difference between them is not remarkable.

Although the rural dentist works slightly less in terms of hours spent in the dental office, he may in fact work harder when he is there. Some guide to the industriousness of the dentist can be found in a comparison of the number of patients per dentist.

This, however, is an ambiguous figure. Just as it may be used to gauge the industriousness of the dentist, it could with about equal justification be used to indicate the "demand" for dentists' services. Strictly speaking, the figure cannot be used as an indicator of either supply or demand, except in the most trivial sense that the number of patients treated by dentists is equal to the number of patients that received treatment. This is not an impressive conclusion, but the mining of these figures becomes more profitable when they are interpreted in conjunction with the dentists' gross income, the extent of busyness which he reports, and the number of hours worked. For example, if it were found consistently that the number of hours spent in the dental office was directly related to the number of patient visits per year, it would be reasonable to surmise that a low number of patient visits reflected a rather slack practice. This conclusion would be well supported if it were found also that dentists, or counties, reported a low number of working hours and a low number of patient visits per year, and indicated that they could handle more patients.

These factors might better be described as indicators of the supply or abundance of dental services rather than indicators of the demand for dental service. In the rural counties, the population:dentist ratio is normally higher than

[4]These are Bruce, Dufferin, Huron, Muskoka, Norfolk, Parry Sound, Cochrane, Grey, Kenora, Nipissing, Rainy River, Renfrew and Timiskaming.

in predominately urban counties, and this is true also of the adjusted ratio. The dentist's practice is smaller in terms of both the personnel hired and the number of chairs used. The total number of hours which he works is also smaller than his urban counterpart. These factors, described as being typical of the rural dentist, are more accurately correlated with low income areas. Because the correlation distribution of dentists, in terms of the factors which we have considered, is best explained in terms of per capita income, we must question whether the dentist in the rural-low income areas is fully employed. The need to ask this question is even more urgent when it is discovered that his practice is smaller in terms of personnel and equipment and that he appears to work less.

Number of Patients per Dentist

To determine how active the dentists in the study groups are, the "number of patients per dentist" is a preferable indicator to the "number of visits per dentist". The latter figures may well be influenced by regional differences. For example, if there is a great distance between dentist and patient, the dentist might make a greater effort to reduce the number of visits.

The average number of patients per dentist in the predominately urban counties is 1,477; the median for the group falls between 1,432 and 1,444, the averages for Waterloo and Welland. The same figure for the group of ten rural counties is suggestive; the average number of patients seen per year is 1,372. Using 1,372 as a base, the rural dentist sees 7.5 per cent fewer patients than does the urban dentist. This is roughly in proportion to the fewer hours which he works per year, approximately 5 per cent.

The extent of busyness of the two groups may be measured by comparing the ratio of the average number of hours worked to the average number of patients seen. This figure suggests the relative hourly load and, when compared with the opposite group, could suggest whether members of one group have relatively more idle time on their hands. The ratio for the urban counties is 1.26; that for the rural counties, 1.27. The difference here is insignificant, suggesting that neither group spends more idle time in the office than the other. This is only "suggested", because it is impossible with the available data to adjust for the length of time that dentists see patients, differences in the demands of patients, and the quality of service rendered by the dentist. The problem is a simple one. For example, in rural areas the nature of treatment desired by patients may be rather straightforward — an extraction — whereas the urban dentist may find himself more extensively engaged in time-consuming bridge work and cosmetic restoration work. When such imponderables exist, there is little point in trying to adjust.

The data provided by the 1966 Survey give an indication of the busyness of both the rural and the urban groups. The data are presented in Table 9.

These results suggest that the rural dentist is busier than the urban dentist. The catch in interpreting these data is that each dentist has had to determine

TABLE 9
Category of Busyness, Selected Counties

	Category of Busyness[1]			
	1	2	3	4
Predominately urban counties (per cent)	31.5	23.3	37.8	7.2
Selected ten rural counties (per cent)	52.1	20.2	24.6	2.8

[1] 1) Dentist too busy to treat all people requesting appointments.
2) All people requesting appointments received them but dentist felt more rushed and/or worked more hours than liked.
3) Dentist provided dental care for all who requested appointments; had enough but not too many patients.
4) Dentist was not busy enough; would have liked more patients.

implicitly his own subjective standard of what constitutes a busy practice. If the old chestnut about the slower, more congenial pace in the country has any truth in it, the subjective standard of a "busy" practice may be somewhat lower in the rural counties than it is in the urban counties. If this is not true, the results of the survey are inconsistent. On the one hand, the rural group works fewer hours, sees fewer patients per year, but reports that over 50 per cent of them are too busy to see all the people requesting appointments. A quick trip down the columns of Table A21(a) indicates that, among the urban counties, only in Frontenac and Thunder Bay do a large or greater proportion of dentists rank themselves so busy that they had to turn patients away. It is interesting to note that in both these counties the average number of hours worked per year is lower than the average for the predominately urban group.

Median Hours Worked per Year

The standard of what constitutes a busy practice does indeed seem flexible. It varies from a low of 1,455 hours in Bruce to a high of 2,189 in Huron. In other words, it virtually bounds the sample for the whole province. The median falls between Muskoka (1,810) and Dufferin (1,825). The fact that this median is below the average mean for the province, below the median for the province, and below the median for the predominately urban counties does suggest that fewer hours may be worked by dentists in rural counties. Unfortunately, this sample was taken from a sample; under these conditions, medians are notoriously unstable so that a comparison of medians loses much of its significance.

Mean Hours Worked per Year

Although the data contain some extremes and do not recommend themselves to the calculation of means either, the arithmetic mean has been calculated for both

the rural group of ten counties and the predominately urban group. The means were determined simply by dividing the total number of hours worked as reported by the dentists in each county by the total number of dentists. The results of these calculations are quite dramatic. The mean number of hours worked in the rural counties shows a very marked downward bias, a surprisingly low 1,770 hours per year. The arithmetic mean for the predominately urban counties is exactly the same as the provincial mean, 1,860. The fact that the mean for this very large group of dentists (745 of the 986 on which the provincial mean is based) is smaller than the provincial mean, indicates that the total number of hours worked in the country are "evenly" distributed around the mean.

Among the predominately urban group, for example, the average number of hours worked is highest in Peel, yet this county reports that only 22.7 per cent of its dentists fall into category 1. In York, where the average dentist sees 1,529 patients per year and works 1,876 hours, only 21 per cent are so busy that they turn away patients. These figures cannot be reconciled with those for a county such as Frontenac or for the selected ten rural counties without admitting to a very flexible notion of what constitutes a busy practice.

Apparently, rural dentists both desire and obtain a somewhat slower or lighter practice. Possibly the less dynamic man avoids the cities where the competition is stiffer, scrutiny from one's colleagues more persistent, and general professional involvement more intense. The data appear to make such an explanation both plausible and supportable. But such a conclusion cannot be confirmed by the results of the 1966 Survey.

Relative Utilization of Dental Services

Since the allocation of dentists cannot be discussed in terms of the traditional dichotomy of supply and demand, attention must be focused on the *availability* of dental services in both the urban and rural areas. This proxy is comparable to the notion of supply; the proxy to supplant the notion of demand is comparison of the utilization of dentists. Here the data seem to show that the relative utilization of dental services is determined by the amount of dental services dentists are willing to render. Therefore, we concluded earlier that dentists in rural areas appear to both seek and realize somewhat lighter practices. Table 10 summarizes the comparative data on which this conclusion is based.

The data presented here involve an inconsistency, and just as they can be used to demonstrate that rural dentists seek a quieter life, they could with slightly more heroic effort at interpretation be used to demonstrate that the "quiet life" is thrust upon these practitioners by circumstance.

In very simple terms, the inconsistency exists between the evidence of columns 1 and 2, which suggests that urban dentists work harder, and the evidence of columns 3 and 4, which indicates that rural dentists believe their services to be more heavily in demand. The evidence of column 5 in this case is not significant

TABLE 10
Relative Utilization of Dental Services

	1 Av. hours worked annually	2 Av. no. of patients seen	3 Percentage in category 1	4 Percentage in category 2	5 Patients per hour ratio
Predominately urban	1,860	1,477	31.5	23.3	.76
Selected rural	1,770	1,373	52.1	20.2	.78

because the ratio for the rural dentist is not appreciably below that for the urban dentist. If it had been, one might have been inclined to disregard the implications of columns 3 and 4, and conclude that rural dentists are underutilized and have adapted the conditions of their practice to this fact.

In the preceding paragraph, the category 1 busyness index has been interpreted as "too busy to treat all patients seeking appointments". This has testable implications. Dentists who place themselves in this category must believe that there exists unsatisfied demand for their services. The normal reaction, since dentists display no strong disinclination to make money, would be to expand one's practice to take advantage of this unsatisfied demand. There should be some evidence, therefore, in the net income, gross income, number of chairs, or number of personnel hired to indicate the response of the rural dentist to a relatively higher demand for his services.

Relative Size of Dental Practice

Comparing the relative size of dental practices involves some conceptual difficulties. For example, which is larger: a practice containing a dentist, a hygienist and an assistant, or a practice with a dentist and two assistants? For some purposes, the size of the two practices may be taken as the same; for others, they may be quite different. To resolve this, it is tempting to determine the "size" in terms of the number of patients that could be treated if the team were effectively used. It may be tempting, but it is not possible. Under controlled conditions the Canadian Army Dental Corps experimented with a variety of personnel mixes to determine the most productive combinations of personnel. The results of these experiments cannot be applied to the dentist in private practice. One of the best measures of the productivity of different personnel would be a comparison of income figures but, as pointed out, this is not presently (at the time of writing) possible.

Availability of Personnel

Another difficulty in comparing the size of practices arises from the availability of trained personnel in the rural counties. Even the most perfunctory glance at Table A18(a) reveals an almost complete absence of either technicians or hygienists in

any but the predominately urban counties. The location of these personnel is apt to be influenced by considerations other than the salary they are offered.

The hygienists are, of course, all women and typically married, so that their mobility is severely limited. Obviously, the salary differential between rural and urban would have to be considerable to induce the family to move. If the hygienist is unmarried, there exists the classical problem of finding a suitable mate. Most young women assume that their quest is likely to be more successful in larger centres than in a village. Again, the salary differential would have to be considerable before the hygienist would relocate. For both the married and the unmarried hygienists, there is also the problem of continuing employment. In the larger centres, if their employer decides to close up shop, they undoubtedly could find employment as hygienists — a hygienist anywhere in the province is still a relatively scarce commodity. If, however, their fortunes are tied to dentists in small communities who close up shop, further employment as hygienists may well depend upon a decision to move. This, of course, involves all the costs — financial and otherwise — of moving from one town to another. For the girl desiring continuous employment as a hygienist, it makes more sense to stay in the big town.

The male technician faces some of the same questions that a hygienist must ask herself before deciding to move to a rural area. Perhaps, again, the most important question is the prospect of continuous employment. The prospects undoubtedly look better in the larger towns. Hence, it would require a large salary differential or some fortuitous combination of circumstances to induce the technician to move to the country and throw in his lot with, perhaps, the only dentist in town. One thing seems clear, therefore: to hope that hygienists or technicians will move in response to salary differentials is to hope for very large differentials indeed.

The case with respect to assistants, secretaries or receptionists is different. These people can be, and usually are, trained on the job by the dentist. Normally, they can be recruited from the local population and, in many cases, very cheaply. For these reasons, the rural dentist is likely to expand his practice by recruiting more assistants and secretaries, whereas his counterpart in the city probably would go into the market for a hygienist. A priori, there is very good reason to expect urban and rural practices of comparable size — in terms of the amount of service they are capable of rendering — to show different personnel mixes. The economist would arrive directly at this conclusion by noting that a factor price differential exists between the urban and rural counties.

The empirical problem, which can be neither solved nor circumvented, is the determination of the trade-off ratios between personnel mixes. Under these circumstances, the best one can hope for is a plausible heuristic argument which is, of course, impressionistic. One's impressions are best verified by the evidence in Table A12(a).

Of the fifty-seven full-time hygienists reported in 1966 whose locations are known, all but seven are in the predominately urban counties; only one is in the selected ten rural counties. A more accurate notion of the distribution of hygienists can be found from the register: 201 hygienists are found in the predominately urban counties; only eleven are found in the selected rural counties. In absolute terms, as one would expect, the preponderance of hygienists is found in the urban counties. Expressed as a percentage of the number of dentists, however, 9.04 per cent of the dentists in urban counties have hygienists compared to 6.62 per cent in the selected rural counties. More suggestive of the relative magnitudes is this simple ratio: there is one hygienist for every eleven dentists in the urban counties and one for every fifteen in the rural.

How significant are these figures? There are proportionately fewer hygienists in the rural counties, yet the number is surprisingly high. As already indicated, there are some plausible reasons for hygienists to avoid the rural areas. The fact that rural dentists have attracted this many to the rural counties suggests that they may have made extraordinary efforts to increase the size of their practices. This, however, is pure speculation; one would have compelling evidence of this only if the ratio of hygienists to dentists were higher for the rural areas than for the urban counties. Since it is not, no inference about the demand for dental services in the rural counties can be made from the data on the distribution of hygienists. Again, the conclusion is negative: there is no evidence from the distribution of hygienists that rural practices expand in response to greater demand for dental services.

The disincentives which may persuade technicians and hygienists to eschew the country do not apply to the dental assistant and secretary-receptionist. Indeed, the cost of such personnel may well be below the cost of the same personnel in the urban counties. On an a priori basis, therefore, one would expect that if the rural practice were faced with a strong demand for its services relative to the urban practice, it would attempt to expand by hiring more of this type of personnel.[5]

Full-time Employees

In Table 11, the type of personnel has been expressed as a percentage of the number of dentists responding to the questionnaire from the urban and selected rural counties. In determining the relative size of the urban versus rural practice, there exists the problem of translating the part-time employee into full-time equivalents. It is instructive, therefore, to concentrate on full-time employees for a moment.

There appears to exist a rather striking difference in the type of full-time personnel hired by the rural and urban dentist. The rural dentist hires proportionately more assistants and fewer secretaries. Interestingly, however, the total number of

[5]The 1966 Survey provided some data on the type of personnel hired by dentists; this information may be found in Table A18.

full-time employees in the assistant and secretary category is an identical 104 per cent. This suggests that the urban dentist may be deliberately trading off assistants for secretaries. The explanation may lie in the fact that trained secretaries are more easily obtained in the urban centres, and that the dentist already has a hygienist. If, using the figures from the 1966 Survey, the full-time hygienists are added to the full-time employees, expressed as a percentage of the number of responding dentists, we find that the number of full-time employees in the urban counties is 110 per cent of the number of dentists. The same figure for the selected rural counties is 105 per cent. These figures suggest that it is the urban practice, and not the rural, which is expanding to meet the pressures of demand for more dental service.

Part-time Employees

Unfortunately, this is only part of the story; the rest of it is told in the figures for part-time employees, and these are rather more difficult to read. There are two problems in deciphering the message of the part-time figures. First is the problem of whether part-time employees in the rural counties work more or less than part-time employees in the urban counties. There are no data on this question; therefore, the work week for both groups is assumed to be the same. Second is the problem of determining how long part-time employees actually work; in other words, how many part-time employees are the equivalent of one full-time employee.

This is an important consideration. In Table 11 the size of the full-time urban practice would appear to increase quite sharply over the rural practice, the longer the work week of the part-time employee is assumed to be. The assumption made here is that the part-time employee on average works 50 per cent as long as a full-time employee so that two part-time employees are the equivalent of one full-time employee. Neglecting the hygienists, the urban practice now appears larger than the rural practice. If the part-time employee works longer than estimated here, the discrepancy between the size of the urban and rural practice grows even more striking. With this selected ratio of 2:1, however, the full-time equivalents for assistants plus secretaries is roughly 119 per cent for the urban, compared with 113 per cent for the rural. These figures, coupled with the longer week and year worked by the urban dentists, make it extremely difficult to support the assertion that there is a greater unmet demand for dental services in the rural counties. The figures, once hygienists are taken into account, begin to suggest that the exact opposite may be true. The full-time equivalents for hygienists, assistants and secretaries expressed as a percentage of the dentists is 129.2 in the urban counties, compared with 115.7 in the selected rural counties.

Before leaving these figures, it seems well worthwhile to reiterate both their significance and the reasoning which lies behind them. It has been argued that if there existed a shortage of dentists in the rural counties, the rural dentist would attempt to expand his practice by hiring more auxiliary personnel. In other words, the size of the practice would reflect the demand for dental services. We have

TABLE 11

Type of Personnel as Percentage of Number of Dentists Responding

Type of Personnel		Urban %	Rural %
Assistants	Full time	84.12	91.42
	Part time	21.00	12.85
Secretaries	Full time	20.51	12.85
	Part time	7.81	4.28
Assistants and secretaries	Full time	104.63	104.27
	Part time	28.81	17.13
	Full time equivalent	119.03	112.87
Hygienists	Full time	6.1	1.4
	Part time	8.3	2.85
Hygienists, assistants, secretaries	Full time equivalent	129.2	115.7

SOURCE: 1966 Survey of Dental Practice in Ontario.

found, however, that the urban practice expands to a larger operation than does the rural practice. This, coupled with the evidence on the length of the working year and week, clearly suggests that there is no greater unsatisfied demand for dental services in rural counties. In fact, the urban practice seems so significantly larger than the rural practice that one is tempted to infer that the demand for dental services is more pressing in the urban than in the rural areas.

In relative terms, it means that the "shortage" of dentists in the urban counties has been met in part by the expansion of the dentists' practice to include more personnel. This conclusion seems supported by the evidence of the longer work week, longer work year, and slightly larger patient load of the urban dentist, and it fits in neatly with the evidence of the regression analysis.

Conclusion

It will be recalled that the regression analysis suggested that 40 per cent of the variance in the distribution of dentists could be "explained" by the per capita income of the county. Where per capita incomes are found to be low, the population:dentist ratio is high. Normally, therefore, one would expect the demand for dental services to be lower in lower income areas; this being the case, one might expect that fewer dentists would locate in these areas. To some extent, this has happened.

However, the assumptions that too few dentists have taken up practice in rural Ontario, that the demand for dentists in rural Ontario has been underestimated, and that a disproportionate number of dentists have remained in the cities do not stand up under examination. The evidence assembled here does not support them. It appears that the demand for dental services is very significantly lower in rural Ontario than it is in urban Ontario. Although population:dentist ratios are higher in rural Ontario, the dentists in these areas do not maintain practices as large in any physical sense — number of employees, patient load, length of working year — as do the urban dentists. The one piece of conflicting evidence is the subjective evaluation of the busyness of the practice. Dentists in rural Ontario subjectively "sense" a demand for their services which they report they are unable to meet; or more correctly, this attitude is more prevalent in rural Ontario.

Our analysis thus far should have clarified two points. First, it is unsatisfactory to evaluate the efficacy of any professional health services in terms of a population ratio, especially when the provision of service is undertaken in the absence of universal health schemes. Whether or not a particular service is adequate depends very largely on the demand for the service. While this is a simple straightforward point, population ratios undoubtedly will continue to have considerable fascination for some people. The essential point to be made here is that these ratios cannot be used to refute the preceding analysis; if anything, they confirm it.

The second object which the analysis should have achieved is a satisfactory refutation of the *general* presumption that there is an imbalance of dental services within the province, and that it is to the disadvantage of the rural counties. What it most certainly has not done is cast any light on the plight of specific communities. A detailed look at some individual communities suggests that they are, in fact, the victims of a rural setting. A detailed survey of the province shows several communities which have the ability to support a dentist, but do not have one.

The three most obvious conclusions are, first, that there appears to be no relationship between wealth and the distribution of dentists for the twenty-nine fairly randomly selected counties; second, that the relationship improves considerably when only urban counties are considered; third, the dropping of the nonconforming Frontenac county yields substantially the best fit of all.

One must be wary, however, of drawing the conclusion that wealth is a major determinant, or even a determinant at all, in explaining the distribution density of dentists in Ontario's urban centres. The main and obvious reason for such wariness is that there are many other factors, which may or may not be related to wealth, that account for the location of a dentist. In particular, one could enumerate the location of a county (in the sense that a person might prefer to reside in London as opposed to Sudbury), the home town of a dentist, and the whole host of other extraneous considerations — such as climate, desirable or undesirable features of a city, influence of dental supply men, place of education — which form part of a person's decision as to where to live. Further, as an empirical observa-

tion, it is unlikely that most persons are aware of income differentials between cities or counties, or even if they are that they are greatly influenced by them, so long as they are not too wide. Therefore, the conclusion that one is driven to, particularly in view of the small number of regression runs and the small number of samples taken, is that very little reliance can be placed upon income as any sort of an explanatory variable of the distribution of dentists in Ontario's urban areas.

Undoubtedly, these communities are the victims partly of their location, and partly of an imperfect market which does not supply information to the young dentist about the advantages and disadvantages of locating in different areas. To some extent this information gap, which may once have had adverse effects on many specific communities, is being closed. Through the dental faculty, the graduating dentist can get information on the size, per capita income, and number and age distribution of both the dental practices and the population of all towns and cities in Ontario. Persons involved in presenting and discussing this information with graduating students feel that it has considerable influence on the students' choice of location.[6] The small rural community is apt to suffer from obscurity, and even the meagre but vital information which the student can now obtain is sufficient to lift some communities out of oblivion.

When a community is large enough to support a dentist, a determined effort to attract a dentist will usually meet with success. There are towns, however, which — because of location and size — cannot support a dentist. For example, a town of 1,800 with little service area beyond and midway between two larger centres, probably could not support a dentist. The annual patient load in a town of this size may well be less than 800 — not enough to keep the dentist fully occupied.

If one assumes that no particular individual or group is especially entitled to dental care, and that dental services should be distributed to maximize the use of the available service, then one should not be disturbed to see the town of 1,800 go without a dentist. Of course, the residents of the small town may not see the problem in the same light. But the fact is that any dentist who, overwhelmed by propaganda, might move to this hypothetical town of 1,800 would have been more efficiently used if he had established his practice in an urban county.

Since a substantial proportion of the provincial population falls into units which are uneconomic to service with a resident dentist, this problem must be given further thought. It is evident that under current conditions, these communities cannot be provided with local service.

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[6]Interview with Dr. Mintor, formerly of the Faculty of Dentistry of the University of Toronto.

Appendix I

Summary of Regression Analysis Results

An attempt was made to explain the geographic distribution of dentists in the province by searching for a relationship between the population:dentist ratios and general per capita incomes of the population (used as an index of "wealth") of selected Ontario counties. One would expect lower population:dentist ratios in the wealthier counties. In other words, the a priori assumption is that dentists will locate in greater relative numbers in the wealthier areas of the province.

Data were fitted to the simple linear regression model, $y=a+bx$, with the population:dentist ratio being the independent variable y and per capita income being the dependent variable x. Results were obtained for three different sample sizes and for two different years. First, 1961 data were fitted for twenty-nine selected Ontario counties;[1] then a sample of eleven[2] of the most "urban" counties in the province (that is, those counties where at least 75 per cent of the population resided in urban centres) was tried, with York and Peel counties being taken as a single county unit (since Metropolitan Toronto reaches into Peel county). It was noted merely by inspection that Frontenac county differed radically from the expected pattern in that it had both a relatively low population:dentist ratio and a relatively low per capita income, and consequently may have had a disproportionate effect on the regression results. Thus, the 1961 data were fitted to ten "urban" counties (i.e., the previous sample of eleven counties minus Frontenac). Still using this sample of ten "urban" counties, more up-to-date figures were used — specifically, 1966 population figures, 1967 number of dentist figures, and 1965 per capita income figures. Here two different techniques were tried. In one, the independent y variable was the normal population:dentist ratio; in the other, an "effective population:dentist" ratio was used (i.e., a ratio in which all dentists over the age of sixty-five were counted as one-half a dentist).

The results of the various regressions are summarized in the following table.

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[1]Haldimand, Norfolk, Hastings, Renfrew, Kent, Northumberland-Durham, Bruce, Lambton, Ontario, Perth, Peel, Oxford, Brant, Grey, Essex, Welland, Elgin, Halton, Wellington, Waterloo, Middlesex, Simcoe, Lincoln, Wentworth, Peterborough, Dufferin, Carleton, Frontenac, York.

[2]Brant, Essex, Welland, Thunder Bay, Waterloo, Middlesex, Wentworth, Lincoln, Carleton, Peel-York, Frontenac.

TABLE A1

Linear Regression on Population:Dentist Ratios

Sample size n	Year	Regression equation	Value of regression coefficient r	Critical values of r	Comments
29	1961	$y = 4130 - 945x$	.11	$r.025 = .381$ $r.010 = .445$ for $n = 29$ $r.005 = .487$	r is not significant
11	1961	$y = 4734 - 1485x$	.64	$r.025 = .602$ $r.010 = .685$ for $n = 11$ $r.005 = .735$	r is significant at the 95% confidence level
10	1961	$y = 5445 - 1902x$	.87	$r.025 = .632$ $r.010 = .715$ for $n = 10$ $r.005 = .765$	r is significant at the 99% confidence level
10	1965-67	$y = 6162 - 1922x$	.70	$r.025 = .632$ $r.010 = .715$ for $n = 10$ $r.005 = .765$	r is significant at the 95% confidence level
10	1965-67	$yE = 7290 - 2380x$	.68	$r.025 = .632$ $r.010 = .715$ for $n = 10$ $r.005 = .765$	r is significant at the 95% confidence level

Appendix II

Dentist Location Functions in the Province of Ontario

Purpose and Method

The purpose of this study has been to identify location functions for dentists in the province of Ontario. The dependent variable to be accounted for is the distribution of dentists per capita among the fifty-four Ontario counties. Three dependent variables were employed in the study: county income per capita; population density, measured by population per square mile; and urbanization, a variable reflecting the extent to which the population lives in urban areas and measured by the percentage of the population residing in towns of over 10,000 people. Across-county data were obtained for the year 1966. Data and sources are presented in Appendix IV.

The method employed was to estimate cross-section across-county simple and multiple regressions. The various functional forms estimated were

$$1) \quad D_i = D(Y_i)$$

$$2) \quad D_i = D(U_i)$$

$$3) \quad D_i = D(P_i)$$

$$4) \quad D_i = D(Y_i, U_i)$$

$$5) \quad D_i = D(Y_i, P_i)$$

$$6) \quad D_i = D(U_i, P_i)$$

$$7) \quad D_i = D(Y_i, U_iP_i)$$

where D_i is the number of dentists per 1,000 people in the i^{th} county, Y_i is income per capita of the population of the i^{th} county, U_i is the percentage of the county population residing in urban areas in the i^{th} county.

Correlation Matrix and Regression Estimates

i) Correlation Matrix.

	D	*Y*	*P*	*U*
D	1.000			
Y	.647	1.000		
P	.520	.609	1.000	
U	.629	.848	.494	1.000

ii) Estimated Equations.

1) $D = .0257 + .00020\ Y \qquad R^2 = .42$
(.0434) (.00003)

2) $D = .0976 + .31607\ U \qquad R^2 = .40$
(.0337) (.05417)

3) $D = .2529 + .00018\ P \qquad R^2 = .27$
(.0149) (.00004)

4) $D = .0380 + .00012\ Y + .14369\ U^* \qquad R^2 = .44$
(.0437) (.00006) (.09916)

5) $D = .0629 + .00016\ Y + .00007\ P^* \qquad R^2 = .44$
(.0494) (.00004) (.00004)

6) $D = .1226 + .24746\ U + .00007\ P^* \qquad R^2 = .43$
(.0341) (.05982) (.00004)

7) $D = .0780 + .00008\ Y^* + .15212\ U^* + .00007\ P^* \qquad R^2 = .47$
(.0496) (.00006) (.09776) (.00004)

(Standard errors in parentheses. Variables with asterisks have coefficients not significantly different from zero at the 5 per cent level of significance.)

Results and Conclusions

The coefficients of all three dependent variables are significantly different from zero when employed individually as explanatory variables (equations 1, 2, and 3). In terms of explanatory ability, Y ranks first, accounting for 42 per cent of the variance of D, U second with 40 per cent, and P third with 27 per cent.

The similarity in magnitude of the R^2's from the Y and U equations appears due to the high collinearity between the two variables ($r_{Y.U} = .848$). When the two variables are employed in the same equation (equation 4), the coefficient of urbanization ceases to be significantly different from zero. This result is not surprising given the high collinearity between Y and U, coupled with the fact that the simple correlation between D and Y is slightly greater than between D and U ($r_{D.Y} = .647$; $r_{D.U} = .629$).

Thus, it appears that Y provides a slightly superior explanation of D than does U, but the margin is slight and a great deal of confidence cannot be placed on its selection over U. Given the high collinearity between income per capita and urbanization, one can say with confidence only that more dentists per capita will be found in high-income urban areas than in low income-rural areas. Either variable is capable of accounting for approximately 40 per cent of the variance of dentists per capita among the counties. For purposes of prediction, Y provides a slightly better fit to the data than does U.

TABLE A2

Dentist Location Functions by County

County	D	Y	P	U
Algoma	.27	1,600	5.870	.81
Brant	.31	1,610	216.020	.76
Bruce	.27	970	26.110	.36
Carleton	.47	1,780	430.260	.92
Cochrane	.19	1,290	1.860	.69
Dufferin	.46	910	30.710	.40
Dundas	.23	980	44.540	.33
Durham	.24	1,340	70.820	.49
Elgin	.32	1,260	85.980	.48
Essex	.29	1,770	397.340	.82
Frontenac	.45	1,480	60.740	.73
Glengarry	.05	520	38.030	.15
Grenville	.25	1,350	50.600	.39
Grey	.36	1,030	36.640	.49
Haldimand	.23	1,300	61.510	.37
Haliburton	.12	780	5.220	.01
Halton	.44	1,250	387.870	.93
Hastings	.28	1,200	40.510	.67
Huron	.29	880	42.040	.41
Kenora	.24	1,210	.350	.49
Kent	.26	1,470	105.010	.59
Lambton	.28	1,540	96.290	.69
Lanark	.29	1,140	36.210	.57
Leeds	.40	1,330	54.580	.51
Lennox and Addington	.03	810	21.540	.26
Lincoln	.39	1,960	440.030	.80
Manitoulin	.18	630	6.630	.13
Middlesex	.44	1,710	201.130	.83
Muskoka	.39	1,190	17.470	.34
Nipissing	.32	1,130	9.720	.63
Norfolk	.27	1,160	79.770	.37
Northumberland	.17	1,030	61.400	.45
Ontario	.25	1,820	200.250	.81
Oxford	.32	1,380	99.360	.55
Parry Sound	.21	920	6.530	.28
Peel	.33	1,940	367.420	.86
Perth	.26	1,460	71.930	.59
Peterborough	.40	1,510	57.920	.75
Prescott	.11	760	54.960	.49
Prince Edward	.14	840	54.630	.29
Rainy River	.15	1,190	3.540	.65
Renfrew	.26	990	29.720	.61
Russell	.01	870	51.850	.27
Simcoe	.34	1,130	89.670	.61
Stormont	.26	1,300	144.530	.76
Sudbury	.20	1,460	9.640	.73
Thunder Bay	.31	1,600	2.730	.80
Timiskaming	.19	1,140	7.990	.64
Victoria	.22	1,030	22.930	.47
Waterloo	.41	1,770	420.010	.86
Welland	.27	1,550	462.060	.83
Wellington	.35	1,480	92.420	.70
Wentworth	.41	2,160	860.910	.90
York	.58	2,200	2,288.000	.97

SOURCES: DBS, Census of Ontario, 1966; RCDS Directory, June 1967; RCDS Print-Out Sheets, 1967.

Chapter 4 The Structure of Private Practice in Ontario

In an overwhelming majority of cases dental services are provided in the context or setting of the private practice. To a very large extent, the efficacy of the Royal College of Dental Surgeons, the educational system, indeed the whole structure of the dental industry and profession, is to be judged by their effects on private practice and by what takes place in the context of private practice. This is the point of contact of the patient, the industry and the profession; what happens at this point is crucial to the patient and the defence of the public interest.

The reader must already be aware of various possible "delivery systems" or of the possible "arrangements" under which dental services may be "delivered" to the patient. Although one practice can vary from another, the variation is limited to relatively few possibilities. It is possible, therefore, to categorize practices by reference to relatively few operational variables.

Location

Perhaps one of the most obvious variables is one which is consistently overlooked. This is the physical location of the practice within the community. There are a variety of issues here which deserve study and consequent action on the part of the RCDS and the provincial legislature.

Zoning By-Laws

Depending upon specific municipalities, both the location and nature of the dental practice can be decided and adversely affected by local zoning by-laws. It is beyond the scope of this report to attempt to review the situation generally in Ontario, but perhaps the significance of local zoning by-laws can be indicated by reference to a few specific examples. In a municipality in the Toronto area there exists a zoning by-law which permits dental offices in residential areas provided that the offices cannot be considered clinics. A clinic, for the purposes of the zoning by-laws, is a dental office which contains two or more dental chairs. This by-law, which ostensibly is concerned with zoning regulation, could have a profound effect on the efficiency of the dentist, the number of dentists who would locate in the municipality, and the availability and cost of dental services in the municipality. For the record, it might be noted that the specific municipality in which this by-law is in force is not a luxury urban subdivision, but a rural municipality. One would expect to find this type of exclusion far more often in urban municipalities.

More commonly found, however, are by-laws which flatly prohibit dental offices from locating in particular areas, generally residential areas. The effect of these zoning by-laws is obvious insofar as it concerns the physical immediacy of dental services. Distance might deter some people from seeking dental services, especially mothers of small children, who might not bundle their youngsters off to the dentist as regularly as they would if he were just a few doors away.

The prohibition against establishing dental offices in residential areas compresses the number of dentists into relatively smaller sections of the city, principally those zoned as commercial. It could have the effect also of making it more difficult for the young dentist to establish himself in a practice, although the available evidence suggests that typically the young dentist establishes himself rather rapidly.

A third and more subtle effect is the impact of such zoning by-laws on the cost of operating a private practice. Here the ramifications are apt to be rather complicated. If dentists take the fee schedule as given, but have some notion of the proper net income that they should earn, the additional costs imposed upon them by having to operate in a commercial zone might induce them to work longer hours. This could be considered a highly beneficial side effect. If, on the other hand, dentists do not accept the fee schedule and still have some notion of a "proper" income, they may simply increase their fee schedule to compensate for the costs of operating in a commercial zone. The actual effects of these zoning by-laws are difficult to determine, however, for there is little evidence on how individual fee schedules are, in fact, determined. Still, it seems likely that they would have the effect of increasing the cost of dental services, although perhaps not significantly.

The ability of the Royal College of Dental Surgeons to control local zoning by-laws is, to say the least, rather limited; this is the responsibility of the provincial government. Under the Municipal Act, the provincial government could restrain local municipalities from using zoning by-laws to prohibit the operation of dental practices in different zones (this applies also to physicians' practices). The Royal College of Dental Surgeons might well be advised to investigate the effects of zoning by-laws on the location of private practices and their organizations, and make recommendations to the appropriate ministers for suitable changes in the Municipal Act. If the RCDS does not show the desired initiative, the provincial government itself should give some thought to the matter.

Alternative Locations

The private practice is seldom found in public institutions. The pattern typically is for the practice to be located in the dentist's home; in a medical arts centre or clinic, containing other dentists, physicians and professionals; or "over a bank" in a commercial area. These locations often have much to recommend them, and are chosen because of recognized locational advantages. They do not exhaust those

possible locations which have very marked advantages, however. Three public institutions that might well have a dentist in private practice located within them are the hospitals, public schools, and community health centre or multi-discipline group practices. This would require some revision in the concept of these institutions.

Schools

The suggestion is basically simple. Most school boards do not appear to be enthusiastic about providing dental services for school children. There is, however, an alternative which would probably be well within the range of both the financial capabilities and ideological constraints of most school boards. It would involve the construction of space suitable for dental offices, either as a part of the school or separately on the school grounds. The office space could be rented to a dentist in private practice with the understanding, perhaps formalized as part of the leasing contract, that as large a part of his practice as possible would consist of school children — including presumably all the children attending that particular school who demand dental services. The dentist would be free still to develop his practice in the same way as he would if he operated "over a bank".

Obviously this type of arrangement would not find favour with all dentists. But it would have strong appeal to dentists who are primarily interested in children's dentistry and perhaps women dentists who do not wish a full-time practice. There would appear to be few special drawbacks as far as the dentists are concerned; indeed, there may be some very special advantages. Since the office would be located in the school, appointments could be scheduled with school children throughout the entire day rather than all "after four".

From the point of view of public policy, there would be some obvious advantages. The psychological significance of having the dentist attached to the school, the demonstration effect of some students going to the dentist on those who normally would not seek regular dental appointments, and the ability of the student to go to the dentist with a minimal interruption in his school day all would be very positive benefits.

This impact of the dentist being physically attached to the school would probably do much more to encourage responsible attitudes towards dental hygiene than any of the campaigns established for this purpose.

One would hope, of course, that in time the relationship between the dentist in private practice and the school in which his office was located would deepen into a mutually cooperative venture. The dentist or his hygienist then could actively encourage students to seek dental services.

This scheme has a further aspect that should not be ignored. It is conceivable that in the foreseeable future dental insurance plans or government-sponsored health plans will be integrated, relieving the patient of direct responsibility for his dental expenses. Such a scheme might well begin with children of school age and

only gradually be extended to the whole population. It is very difficult to conceive of a plan that would not benefit significantly from the presence of dentists' offices in schools. This simple physical arrangement would make it possible to see that successive generations of school children were rendered dentally fit, that they were regularly examined, and that they were made conscious from an early age of the need for good dental hygiene. The juxtaposition of the school and the dentist would make it more certain that all children received treatment and that none was missed simply because of neglectful parents. Nothing in this is intended to suggest that the student would be "forced" to go to the dentist; that option presumably always will be one that can be exercised by the student or his parents. What such a scheme would make possible is the systematic treatment of school children and the systematic canvassing of parents for permission to have their children treated.

It has been the experience in Great Britain that, unless a responsible authority points out a child's eligibility for, and perhaps need of, dental treatment, the parent, through laziness or ignorance, fails to see that his child receives treatment.[1] The school suggests itself as a natural administrative unit for furnishing the contact among the student, the parent, and the dentist.

One hopes that the RCDS and the provincial government will have the foresight to investigate the possibility of introducing such a scheme, at least on a pilot basis. There are a great many variations on this theme. The details of leasing arrangements for the office space by the dentists, and how this limited space could be allocated among dentists are administrative details too minor to endanger the success of such schemes. The issue of financing, which is often critical in the eyes of school boards, should be virtually non-existent. The rentals should be sufficient to cover the costs of constructing and maintaining the office space for the dental clinic. Indeed, modest profits might even arise, in which case they could be used to further the school's program of dental health education.

In its simplest form, this scheme would not create any special problems for the dentist. The conditions of private practice which he enjoys when located "over a bank" would presumably be enjoyed when he "annexed to a school". A more complex relationship with the school would be a matter of choice insofar as the dentist is concerned and could be worked out between the individual dentist and the school board. To the extent that this is possible, the opportunities afforded by location on the school grounds could lead to a somewhat richer professional life.

The nominal commitment required by both the school board and the dentist to initiate such a program provides an inexpensive way for both parties to explore the possibilities of introducing comprehensive and universal dental health schemes into the schools. The role which the RCDS might have in establishing general

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[1]Communicated to the author by British authorities.

policies, and the role which the provincial government would have, with respect both to policy and financing, would depend entirely upon the enthusiasm with which these bodies approached the possibilities. One hopes that the authorities involved in instituting a scheme such as this would approach the problems with sympathy and imagination. Unfortunately, very little imagination has been shown in this realm, either in Canada or abroad. This characteristic lack of imagination extends to the present relationship that dentists have with hospitals.

Hospitals

The relationship of dentists with hospitals might be summed up by saying that currently there is no relationship. Under enabling legislation, a slowly growing number of hospitals are establishing dental facilities. When questioned on the adequacy of these facilities, however, dentists usually have been remarkably candid in their dismissal of the hospitals' efforts. A minority of dentists see the change in the attitude of the hospitals as positive and encouraging. This discrepancy in attitudes probably denotes differences both in personal experience and in the concept of the role of a dental department within a hospital.[2]

The notions of how the dentist ought to be integrated into the hospital appear to range from one extreme to the other. There are those who feel the dentist should be an employee of the hospital and take whatever patients are brought before him, and those who envisage the dentist as operating a private practice from quarters located in a hospital with his own patient list. The latter view usually limits the formal relationship of the dentist to the hospital to little more than the paying the monthly rental for the office space. These extremes represent a very considerable range, and there is probably something to be said for both extremes and for the possibilities between them. One suspects that the most successful scheme for both the hospital and the dentist would represent a compromise between the extremes. What this compromise might be is not our present concern. What is relevant at this juncture is the observation that the traditional separation of the dentist from the hospital has and will continue to have substantial influence on the structure of private practice.

The fact that the dentist has practised independently of the hospital means that he must either duplicate the facilities of the hospital or do without them. These facilities can extend all the way from physical equipment — for example, x-ray machines — to ancillary services such as post-treatment recovery facilities. It also seems highly probable that, if dentists were established in hospitals and had hospital facilities available to them, significant changes in some techniques would take place. For example, greater use might be made of the wide range of technicians in the hospital.

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[2]See Dr. K. Pownall's testimony before the Committee on the Healing Arts, *Proceedings*, April 3, 1967, pp. 2045-2050.

As a consequence of the historic separation of the dentist from the hospital, the dentist, compared with the physician, now depends upon fewer and less skilled auxiliaries for assistance, and must rely on treatment procedures that do not require heavy investment in highly specialized equipment. Indeed, because the dentist is in private practice and cannot draw on the resources of a public hospital, the development of sophisticated equipment probably has been biased in favour of equipment that would require relatively little investment and that can be afforded by the dentist in private practice.

If a significant number of dentists moved into practices which were in some sense hospital-based, their productivity could be increased especially if, at the same time, new forms of auxiliaries were evolved.

The Present System

The advantages and disadvantages of the present spontaneous system of locating private practices call for some comment. Some of the disadvantages have already been suggested. The solo practice limits the use of auxiliary personnel who contribute directly to the provision of dental services. Similarly, it limits the extent to which services related to the provision of dental care can be expanded (for example, post-treatment check-ups on the general health of an elderly patient). It limits the development of expensive and sophisticated technology. The changes in dental technology since the Second World War have had very encouraging effects on the productivity of the dentist; but they have not been impressive when compared to the amazing advances in medical technology. The strides in this field are related of course, to the ability of the much expanded hospitals to justify large expenditures on specialized equipment. Because it has been so completely decentralized, dentistry has not participated fully in the general advance of medical and related technology.

The failure of dentistry to keep pace with the advance of technology has probably meant both higher per service charges for the patient and lower relative incomes for the dentist. The same is undoubtedly true of the dentists' failure to expand the functions and types of auxiliaries. The only professional who has experienced a relative increase in income compared with the general increase in income for populations as a whole has been the physician.[3] The relative increase in the physician's income has been attributed partly to the large number of auxiliaries and technicians that he employs. The dependence on a growing number of medical auxiliaries is a function of the growing tendency towards the centralization of physicians' services in the hospital. Because of the decentralization of the dentists, the expanded use of auxiliaries has been much more modest.

Centralization-Decentralization Issue

Whether a dentist practices "over a bank" or in a hospital may seem, at first glance, to make little difference to the nature of his practice. This first glance,

[3]J. Stigler, *American Economic Review*.

however, does not reveal the central issue — should the profession be centralized or decentralized geographically? The notion of centralization usually carries with it the connotation of a loss of professional freedom. Why this should be so is difficult to see. Most physicians, judging by their attitude towards obtaining hospital privileges, do not see the centralization of their services in the hospital as a threat to their professional freedom. In considering the question of centralization, it is to be hoped that the false debate relating to the encroachment on professional freedom and the doubletalk about "threats" to the dentist-patient relationship will not obscure the central issues.

Geographic Accessibility

The principal advantage of the present decentralized system is not that it safeguards professional freedom, or that it guarantees more satisfactory dentist-patient relationships, but that it results in a somewhat wider geographic or physical dispersion of dentists. There appear to be some definite advantages in such dispersion, although it should not be confused with the notion of accessibility. Accessibility has two aspects, only one of which is related to the physical dispersion; the other is the ability of the dentist to see the patient when the patient presents himself, or attempts to make an appointment.[4]

The present decentralization of the profession makes the dentist geographically more accessible. But because of the depressing effects on productivity, he actually may be less accessible than if he were in a large-scale practice. Thus the decentralization of the profession, rather than making the dentist more accessible in any meaningful sense, actually may make his less accessible. This will become more and more true as the population becomes increasingly mobile. Indeed, the population is so mobile now that a shift of dentists' offices to hospitals would probably have little significance in terms of geographic accessibility.

Capitalization

Another aspect involved in centralization, one already alluded to above, is the breakdown of a purely private type of enterprise. One of the disadvantages of decentralization is the relatively low "capitalization" of the dentist's practice. The move to a more centralized organization structure would presumably bring increasing commitments of public funds to dentistry. This would range from the provision of physical facilities and specialized equipment to the commitment of auxiliary personnel.

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[4]This aspect of accessibility will be referred to as the patient load. A heavy patient load means that the dentist's time is being fully utilized and therefore that he is unable to take patients as they present themselves, or on short notice. A heavy patient load is not something that is fixed. The organization of the practice will determine how many patients the dentist can handle before he musters a heavy patient load and becomes inaccessible to patients without long waiting periods.

Independence of the Profession

Apart from the anticipated effects on the productivity of the dentist, this change probably would have significant effects on the individual dentist, and on the image and structure of the profession. In particular, it would require an active and positive RCDS to see that the profession benefited fully from the possibilities offered by location in a hospital.

For reasons which need not be discussed here, many dentists appear to have a "second class citizen" feeling about their profession, and sense that in some way they do not have the glamour and prestige of the physician.[5] This opinion of dentists appears to be common also among physicians. Given this relationship between the two professions, dentists may experience some difficulty in maintaining their professional integrity and freedom in the hospital setting.[6] Here the role of the RCDS could be crucial and very delicate.

The autonomy of the private practice in Ontario is a very striking feature. Set against the background of professions centred in hospitals, this emerges as a distinguishing feature of dental practice. Decentralization and the absence of any formal relationships with other members of the medical professions has contributed significantly to the independence of the dentists. The isolated and independent position of the dentist has some serious drawbacks, however. Thus, an encroachment on complete professional independence is not something that should be vigorously opposed. The physician, in his relationship with the hospital, does not have professional freedom in an absolute sense.

As mentioned elsewhere, another major drawback of decentralization is the difficulty experienced by the RCDS in policing standards within the private practice.

The one aspect of the structural organization of dentistry which supersedes all others in significance is the geographic dispersion of dentists in private offices. It is such an obvious and traditional characteristic of the profession that it has escaped the notice of many critics and apologists of the profession. It must be remembered that the profession does not have to be organized this way. In order to mount an attack on the traditional problems of the profession, responsible authorities must give serious thought to the alternative methods of organization and location of the profession.

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[5]Although, to the author's knowledge, no study has been done on this issue in Ontario, it has been the subject of research elsewhere. For a short summary of these findings see B. A. McFarlane, *Dental Manpower in Canada,* Royal Commission on Health Services, Queen's Printer, Ottawa, 1964, pp. 135-136.

[6]During the proceedings of the Committee on the Healing Arts, the Royal College of Physicians and Surgeons submitted a brief advising the Committee of the desirability of having dentists in hospitals responsible to the Chief Surgeon. This prompted a response on the part of the RCDS which registered strong disagreement with the physicians.

Capitalization

The other two aspects of the profession which will occupy the remainder of this chapter are the degree of capitalization and the dependence on auxiliary personnel. These are studied primarily to discover their effects on the productivity of the dentist and on the dentist's income and fee schedule. Will the ever higher degrees of capitalization and greater dependence on the use of auxiliaries lead to a reorganization of the form of the private practice? Will solo practice, under the prod of economic efficiency, give way to group practices, partnerships, or some other form of cost-sharing arrangement?

To help answer these questions, the structure of the private practice as it is found today must be examined. Again, the information is drawn from the 1966 Survey of Dental Practice in Ontario, with comparative figures compiled from it. To present a consistent picture of the typical practice, some of the material of earlier chapters must be repeated. To those with good memories, we offer a parenthetical apology.

Initial Financing

Having commented upon the physical location of the practice, it seems appropriate to focus attention next on the other physical dimension of private practice — the dental office and its equipment. It is difficult to arrive at a satisfactory estimate of what it would cost a graduating dentist to set up a dental office. With respect to quality, type and quantity, there is a considerable range of equipment which he may purchase. (The difference in quality may often be a question of style rather than functional performance.) Part of the cost of establishing a practice includes the installation of the equipment, involving changes in the electrical and plumbing systems of the building in which he intends to locate. In addition, there are decorating costs for waiting rooms, receptionists' rooms, and so forth. Apparently, it is not uncommon for a new graduate to spend between $12,000 and $16,000 to establish an office. It can, of course, be done for considerably less or for considerably more. In any event, the typical expenditure is large and few are able to establish a practice without incurring debts. No debt figures are available for the members of recent graduating classes, but in the course of interviews[7] the opinion was repeatedly expressed that young dentists would have debts of at least $10,000, directly traceable to the cost of establishing a dental office. These debts are often incurred at a time when the typical dentist is considering purchasing a home. It is reasonable to expect, therefore, that most young dentists are sensitive to financial considerations when selecting equipment for a dental office. Thus, the investment in the dental office might be expected to increase as the practice expands and as the initial debts are retired.

The most important constraint on the level of investment in the practice is its income-earning prospects. Dentists, however, are in the pleasant position of

[7]Interviews conducted by the author during the summer of 1967 with responsible members of the profession.

being considered "good risks" and usually have no trouble arranging financing for the purchase of dental equipment. Loans for these purposes are available through normal channels and, in addition, the manufacturers of dental equipment will arrange for financing. In some rural communities, citizens' associations and other institutions are prepared to provide the physical facilities if a dentist will agree to take up practice in the community for a stipulated term. In spite of this offer, some communities have been unable to attract dentists.[8]

These facts suggest that no graduating dentist need be prevented from establishing a practice upon graduation for financial reasons. Any moderately promising young dentist can find the funds to establish a practice by one means or another.

Number of Chairs

The amount of investment in a practice is reflected by the number of chairs. Table A8 indicates the percentage of dentists utilizing different types of physical equipment (and employees). Approximately 30 per cent of dentists in Ontario use only one dental chair; slightly more than 60 per cent have two; 7 per cent have three; and about one per cent have four or more. The comparable figures from the 1963 Survey of Dental Practice for Canada are 32.8 per cent; 57.6 per cent; 8.2 per cent; and 1.4 per cent. It is surprising that there has been so little change in the comparative figures for dentists using three or more chairs. One might have expected that in the interval between the two surveys, the number of dentists employing greater numbers of chairs would have increased. Also, the provincial average might have been reasonably expected to be larger than the national average for this group. It would be interesting and instructive to know why the figures do not conform to such expectations. Unfortunately, no explanation is available, but one could speculate that the apparently small physical size of the practice reflects a favourable ratio of dentists to the demand for dental services.

Another point which falls into the category of "interesting and instructive" is an explanation of why almost a third of the profession operates with what theoretically represents the smallest type of practice — one chair. Some are undoubtedly new entrants to the profession and some probably represent the older members. It is unlikely, however, that these two extreme age groups account for all of those utilizing a single chair. Many must be in the prime of their professional lives. It may be possible, if this is the case, to expand the availability of dental services within the province by inducing these dentists to expand their dental offices so that they can handle a larger number of patients. The productivity of the single chair practice is, as will be indicated shortly, somewhat below that of practices with two or more chairs. Indeed, the net income to the dentist increases with each additional chair.[9]

The reasons for the one-chair operation are not easily divined. As mentioned earlier, one may be that the income-earning prospects of the practice do not seem

[8]This information was supplied by an officer of the Ontario Dental Association.
[9]See Survey of Dental Practice, 1963, p. 29-32.

to justify an additional chair. If this is the case, there is little point in attempting to induce these dentists to revise their traditional procedure. The failure to acquire two or more chairs, especially in the case of older dentists, may be the result of their having fallen into habitual methods of conducting procedures in the office. If one is happy in his present situation, there is little inducement to change. A change in the habits of some dentists might require a revision of procedures, perhaps the hiring of additional auxiliary personnel and changes in patient relationships, and perhaps a more demanding day. To such a man, the acquisition of an additional chair may be regarded as a very mixed blessing, regardless of the financial benefits that could flow from it.

To help overcome this attitude, a catalogue of the benefits that stem from the second chair should be made by members of the profession who regard it as a necessary and advantageous part of their practice. This, coupled with advice on how procedures can be amended to make full use of the second chair (in other words educational instruction on the use of the second chair), is the only way to induce more dentists to adopt a two-chair practice. "Heaven itself hath not the power to legislate over these matters", and yet the public interest and the good conduct of the profession may be well served by such a change. The responsibility for persuading dentists to organize their practices efficiently lies with the RCDS. This body should provide leadership in these matters. But its efforts should be complemented by the educational program of the Ontario Dental Association.

Another aspect of the number of chairs problem is how many chairs one dentist can use and supervise effectively. There is a limit, presumably, on how much one man can do. It seems appropriate, therefore, that the RCDS should investigate how many chairs one dentist can supervise and at what point the quality of the service rendered is apt to deteriorate. Dentists, along with other professionals, have an abhorrence of assembly-line techniques in the performance of their professional duties. The justification of this attitude is the belief that some professional services simply cannot be rendered effectively without the direct and immediate attention of the professional. As the number of auxiliaries and the number of chairs expands, the dentist is thrown necessarily more and more into a supervisory role. In itself, there is nothing wrong with this; dentists should be encouraged to move in this direction. However, given the current state of technology and the professed interest of the RCDS in maintaining standards of quality of the services, there is a limit to the extent to which the dentist can act as a supervisor and satisfactorily perform his function as a professional.[10] It is incumbent upon the RCDS to see that some of the more ambitious members

[10]Some very interesting experiments in the training and utilization of auxiliaries have been conducted by the Royal Canadian Dental Corps. In one of the last stages of the experiment which has extended over several years, there was evidence to suggest that the limiting factor in the productivity of the specially trained auxiliaries was the supervisory capabilities of the dentist. K. M. Baird, G. B. Shillington, D. H. Protheroe, "A Pilot Study on the Advanced Training and Employment of Auxiliary Personnel in the Royal Canadian Dental Corps", *Journal of the Canadian Dental Association*, Vol. XXVIII, No. 8, 1962.

of the profession do not exceed this limit.[11] At present, it seems that very few, if any, have reached the limit.

One method of determining the relative productivity of dentists in different situations is to compare net incomes. This approach has certain inherent disadvantages. In the present context the productivity of additional chairs fails to allow for differences in fee structures, the scope for expanding the practice, the utilization of auxiliaries, and the extent of investment in other forms of physical equipment or facilities. These are rather important things not to allow for; therefore, rather than take the figures too seriously, a rough estimate of the loss of dental services in monetary terms due to one-chair practices may be more useful. The estimate will involve some rough rounding of figures to remind the reader of the speculative nature of the exercise.

Approximately 800 dentists in the province employ one chair only; they earn approximately $6,000 less than those dentists employing two chairs. Using only one chair, they collectively net approximately $11,490,000 per year. If they employed two chairs and earned what dentists currently employing two chairs earned, they would net $16,400,000 per year. The difference between what they do net and what they could net if they had two chairs is approximately $4,900,000 per year. In terms of dentists using one chair, this loss of dental services is equivalent to 340 dentists. Admittedly, this unsophisticated approach to the problem has resulted in an overestimate of the loss of dental services. But if the figure is halved, it still amounts to the equivalent of a loss of 170 dentists; even if the figure 340 is four times too high, the loss would amount to eighty-five dentists, still a very significant number. Indeed, at the present rate of the utilization of dental manpower, eighty-five industrious dentists could service a city with a population of a quarter of a million people. This seems extraordinary and one might dismiss it as the consequence of playing foolish games. It should be remembered, however, that the figure eighty-five is a long way from the initial estimate of 370. It is a very serious game.

The Use of X-ray Machines and High Speed Drills

The number of chairs employed by the dentist is not the only index of the degree of capitalization of the practice, but it is perhaps one of the best. As a result of the 1966 Survey we have two other measures of capitalization and the degree to which the profession has embraced modern technology. These two indicators are the use of x-ray machines and the use of high speed drills. Table A8 (d) indicates that 97 per cent of the dentists in the province use x-ray machines. This represents virtually universal adoption. (But as a matter of curiosity, it would be interesting to know why 3 per cent have not yet resorted to x-rays.) An equally high percentage, 94 per cent, have adopted high speed drills.

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[11]The RCDS, through the vehicle of a by-law, prohibits any dentist from hiring more than one full-time hygienist.

Together these figures serve to suggest that the profession is not hostile to the introduction of new technology; but it would be rash to read much more than this into these figures. Both the high speed drill and the x-ray machine fall into the class of technological advances whose advantages, and the corresponding increase in productivity, are readily apparent. Also both require relatively little modification in clinical procedures, and what modification is necessary tends to simplify procedures rather than complicate them.

This being the case, it is impossible to deduce the readiness with which new technology would be generally embraced. Technology which requires retraining and further self-education of the dentist may be adopted much more slowly. This would apply, for example, to advances in pharmacology. Indeed, in the course of our interviews,[12] the opinion was expressed that the typical member of the profession probably was not as conversant with the progress being made in pharmacology as he should be, and that new drugs were liable to be either neglected or misused. No concrete evidence exists to contradict or confirm this general impression and, as is the case elsewhere, what happens in the privacy of the practice remains something of a mystery. Like it or not, impressions must serve as evidence here — and impressions are apt to tell a rather different story than the statistics would if they were available.

Asked if the typical member of the profession was innovative, interviewees and authorities in the profession generally said no. Some touted this as a virtue. The restraint shown in adopting new technology is felt to be an indication of professional responsibility. This view is probably justified, if it is not founded upon an ill-conceived conservatism.

The policy implication of these impressions is not without significance; it suggests that some gains in productivity may be missed because of a conservatism regarding technology. It should be part of the normal function of the RCDS, therefore, to review the advances in technology and the degree to which they are adopted by the members of the profession. If the adoption of technology is slow, then it should be incumbent upon the RCDS to effect programs to encourage its earlier adoption. These programs might vary from the mere provision of information to lectures or retraining programs. Undeniably, the regional dental hospital envisaged in Chapter 10 would be a valuable instrument by which technological information could be disseminated.

The Use of Auxiliary Personnel

The next aspect of our inquiry is the dependence of the private practice on auxiliary personnel. The issue of the type, numbers and importance of auxiliary personnel is one that has arisen at various junctures of this inquiry. They were the subject of comment in the chapter on dental manpower in the province; they

[12]Conducted by the author.

are to be discussed here. This repetition cannot be avoided and, given the importance of the subject, it would be unwise to attempt to avoid it. With this apology in mind, the reader should prepare himself for a review of the statistical information available on the subject.

Table 12 indicates the percentage of dentists employing specific types of auxiliary personnel, both part time and full time. It also shows the number of dentists employing "mythical auxiliary personnel", part time, full time and composite. Since one is unlikely to meet the mythical auxiliary personnel at a cocktail party, the nature of this creature requires some explanation. She is a composite of the existing types of auxiliary personnel, created by lumping together all grades of auxiliary personnel without weighing the significance of the differences among them. The composite mythical auxiliary also assumes that each part-time auxiliary is equivalent to one-half of a full-time auxiliary. For comparative purposes, the concept is treacherous; and for this reason, it is described as "mythical". Straight comparisons of this figure for different times or between different jurisdictions would fail to allow for the ratio of one type of personnel to another (the "personnel mix") being quite different. The mix is important because different types of personnel presumably have different impacts upon the private practice. These could range from the obvious impact on the dentists' productivity to more subtle effects on the nature and the quality of the service rendered. With this caveat in mind, the concept of the mythical auxiliary is useful because it does provide some index of the dentists' dependence upon auxiliaries.

The message contained in the concept of the mythical auxiliary personnel cannot be taken as a cause for rejoicing. The typical dentist employs only 1.16 full-time auxiliaries and .39 part-time auxiliaries; together, these represent 1.36 full-time auxiliaries. The dentist does not appear to rely very heavily upon auxiliaries. It is surprising that such a large percentage of the profession — 15 per cent — does not employ even a dental assistant.

TABLE 12

Percentage of Dentists Employing Specific Types of Auxiliary Personnel

Type of personnel	Percentage of dentists employing personnel	
	Full time %	Part time %
Hygienist	5.36	7.54
Technician	3.9	1.98
Assistant	85.8	19.43
Secretary	21.7	7.54
Mythical auxiliary personnel	116.0	39.0

Location of the Dentist

The data in Tables A8(a)-(c) provide some information on the "atypical" member of the profession, that is the dentist who does not employ a dental assistant. Oddly enough, it appears that he will be found either in towns or villages of under 3,000 or in a city of over 500,000 — Toronto. Between these two extremes, the probability that he will hire an auxiliary increases dramatically, until in a city of between 25,000 and 30,000 population, it is almost certain that he will have acquired a dental assistant. The data do not provide an explanation for such behaviour, but one can speculate. Are cities in the middle range the areas where the demand for dental services press most heavily upon the available supply of dentists; and is it in response to this pressure that the dentist has acquired auxiliary personnel? These middle range cities present a unique set of circumstances. They may not be large enough to hold out any inherent appeal to the profession; their cultural life, for example, is apt to be depressed when compared to that of more metropolitan areas, particularly Toronto. Income and the degree of urbanization are likely to be so high that they create a high effective demand for dental services. While this seems a plausible line of argument, it runs contrary to the evidence contained in Table A21 (b), which suggests that dentists in these middle range cities are not subject to unique pressures. Indeed, the table fails to suggest any significant pattern at all. As pointed out in the chapter on geographic distribution, however, the evidence of the subjective evaluation of the degree of busyness probably is not an accurate indicator of the true degree of busyness. For this reason, the preceding explanation of the factors affecting the acquisition of auxiliary personnel retains its plausibility.

Age of Dentist

The age group between thirty and forty-five is the one most likely to hire auxiliaries. For those under thirty, an auxiliary is not warranted until the dentist has established a large enough practice. For those beyond sixty, the traditional form of practice did not include auxiliaries; the older dentists may not have responded to the postwar developments which introduced this type of personnel. Also, many of these dentists are in semi-retirement, so that the size of their practices may not warrant hiring an auxiliary.

Number of Chairs

As one would expect, those dentists employing only one chair are those most likely to forego the assistance of an auxiliary. Approximately 30 per cent of the profession utilizes only one chair; within this group 24 per cent are without any full-time employees. Of the remaining 70 per cent which employ two or more chairs, only 3 per cent are without full-time employees.

The loss of dental services in the one-chair practice has already been discussed. Much of this loss is probably caused by the group which employs no full-time

assistants. As a matter of continuing policy, the RCDS should encourage the expansion of these practices, so that the dentist may make effective use of auxiliaries and modern technology. It is difficult, however, to see how such a policy can be undertaken. The type of dentist who chooses to operate without auxiliaries and with only one chair is typically an older man in a more or less rural setting. The experience of dental authorities in both Canada and the United Kingdom suggests that these are the people most difficult to reach. They do not voluntarily attend conferences or lecture series in anything like the same proportion as the more progressive members of the profession.

It seems unlikely that the structure of these practices can be changed. They will probably become less numerous, however, as these older members of the profession retire. This assumes, of course, that the new dentist will be educated to think in terms of efficiency, so that he will wish to have auxiliaries and reasonably extensive capital equipment at his disposal.

Effective Demand

In a variety of ways the data of the 1963 and the 1966 surveys suggest that the dentist with the larger practice, in terms of either chairs or auxiliaries, will earn more, and therefore, in one sense, have a larger practice.

This evidence does not, however, support the conclusion that all dentists should have at least three chairs and two auxiliaries. Even after expansion, the size of their practices may not warrant these costs. Also, there is no convincing evidence to suggest that one-chair practices are currently too small, or to indicate what the optimal size is. Here, as in other parts of this study, there are no reliable or meaningful data on effective demand. Indeed, as has been suggested, it makes more sense to read the situation backwards. The typical dentist has not increased the size of his practice because the opportunity for expansion does not exist.

The "Typical" Practice

One of the principal faults of the above interpretation is that it does not allow for the possibility of the dentist holding conservative ideas about what the "typical" practice looks like. For this reason, it is worthwhile inquiring into the organizational forms which the private practice may assume, and how these appear to affect such key ratios as the number of auxiliaries per dentist and the number of chairs per dentist.

Solo Practice

Under the statutory provisions, it is not possible to incorporate a dental practice. This leaves three other basic forms of organization. First, the dentist may be a solo practitioner, without partners. Under such an arrangement, he bears all the costs of the practice; typically, he and his hygienist treat all the patients. It is

possible, however, that some dentists who place themselves in this category also hire "assistants" — that is, dentists who for some reason (perhaps because they are recent graduates) work for him, on either a commission or salary basis. During the 1966 Survey, these dentists were asked to classify themselves as being in a cost-sharing practice.

The Survey showed that about 90 per cent of the profession is organized on the solo practice basis. It has been the overwhelmingly dominant pattern for the organization of a dental practice, and is likely to remain so for many years to come.

Cost-Sharing "Partnerships"

The second organizational form is a loose and informal partnership; it is not a partnership in the legal sense of the word. This form is referred to as a "cost-sharing" arrangement. Normally, the dentists involved maintain their own patient pool and absorb some of their own costs — those directly traceable to their part of the practice. Common costs are borne by both in an agreed upon proportion. These may include a receptionist who acts for both dentists, a full-time technician, or the rent for the offices. The basic feature of this arrangement is that both dentists maintain their professional independence.

True Partnership

The third common form of organization is the true partnership. It can vary in details but, in its most complete form, the patients are the patients of the practice and not of a particular member of the practice. Frequently, however, patients express a preference for a particular member of the partnership and their wishes are met. Sometimes, members of the partnership develop particular spcialties; for example, all extractions may be done by one member. Each member has a capital interest in the real property of the practice, and shares proportionately both the expenses and the net revenue of the practice. The partnership usually has greater stability than a cost-sharing arrangement.

It is evident from both the 1963 Survey and the 1966 Survey that these three forms of organization do exhibit important different characteristics. Relevant information from the 1966 Survey is summarized in Tables A7 (d), A13 (c), A14 (d), A15 (d) and A18 (d). One of the most interesting differences among these forms of organization is the utilization of auxiliary personnel. In partnerships, the percentage of dentists using hygienists, technicians and secretary-receptionists is substantially greater than it is for dentists in solo practice and cost-sharing arrangements. The relatively higher utilization of full-time assistants suggests that under the partnership it is possible to realize a more efficient division of labour. Thus, some of the duties of the assistant may be assumed by more specialized personnel, such as the receptionist and the hygienist. Conversely, this suggests that the solo practice usually is not of sufficient size to permit the optimum use of auxiliaries.

Conclusions

An immediate policy conclusion is that the profession as it is now organized may not be able to absorb a dramatic increase of highly trained auxiliaries, specifically the hygienists and the technicians. Hygienists in solo practices frequently complain that they are used as assistants and that their full potential is not realized. There would be little point in society training greater numbers of this type of personnel if they were to be used merely as overtrained assistants. Further study is required to indicate whether the solo practice is capable of effectively utilizing hygienists. Solo practices where the hygienists are not used effectively are probably not typical. Those solo practices that do contain hygienists are probably considerably larger than the norm, more efficiently run, and perhaps aptly described as "luxury practices".

The important issue here is whether the average solo practice can utilize a hygienist. It must be remembered that the average practice is not among the largest nor does it cater to a very affluent minority. The evidence suggests that an inherent disadvantage of the solo practice is that it *cannot* utilize the hygienist.

Chapter 5 Dental Auxiliaries

Few issues relating to the practice of dentistry are as controversial and important as the use of dental auxiliaries. There is a large and growing literature on the subject which the serious investigator must consult for himself. It is characteristic of the debate on dental auxiliaries that on almost all important questions, one finds the authorities contradicting each other. This chapter is intended to offer general comments on the literature, not a detailed review.

The literature is controversial, contradictory and, one sometimes feels, prejudiced to the point of dishonesty. The intensity of debate occurs because the questions relating to dental auxiliaries raise important questions about the future status, income, professional independence and structure of the private practice. Those involved in the profession find it all but impossible to be detached when these issues arise. Those outside the profession appear to be rather more detached, but then appearances are proverbially deceptive.

In very general terms, one of the major differences between those within the profession and interested parties outside it is the attitude towards the competence of the auxiliary. The profession is inclined to question whether auxiliaries are capable of performing the duties proposed for them and, in particular, to doubt that the duties of existing auxiliaries ought to be expanded. This position is concerned chiefly with the quality of dental services. The contrary position is concerned primarily with the quantity of dental services, and the general availability of these services to the population.

The role of the dental auxiliaries can then be viewed from two very different positions, depending upon whether one believes the maintenance of standards or the "shortage" of dentists to be the most urgent problem. Once the basic source of contention is recognized, it seems that the question of auxiliaries probably cannot be discussed usefully unless it is discussed in very specific terms.

Whether standards can be maintained if some duties are passed on to auxiliaries depends upon the training that is proposed for them, the method of selection, the conditions under which they are to perform their duties, and, of course, the specific duties that they are to perform.

The other question — whether auxiliaries ought to be used to alleviate a shortage of dentists or make dental services more widely available — also depends upon many specific details: whether the supply of suitable candidates for training, either as dentists or as dental auxiliaries, is adequate; the relative cost of training

dentists and dental auxiliaries and the length of their working lives; the relative productivity of dentists and dental auxiliaries; the acceptance of the auxiliary by the patient and by the other members of the profession, and so forth.

Any discussion of dental auxiliaries concerns the two questions or issues raised so far: the auxiliaries' impact upon the standards of clinical dentistry, and their impact upon the aggregate supply or availability of dental services. In Ontario it appears that the auxiliary may be called upon to play another role — the educational role or, more broadly, the public dental health role. This, in the author's view, is a very different role from that played by the auxiliary in clinical dentistry. Although it is one that merits close study in itself, it will not be dealt with here at any length.

The primary concern here is the role of the auxiliary in the provision of dental services, and the policies which affect her role. The two salient policy questions were encountered earlier in another guise. The first is whether auxiliaries can be used to alleviate a shortage of dentists; the second is related to the question of standards. The two are not, in fact, distinct but it is convenient to treat them as if they were.

The Use of Auxiliaries to Alleviate a Shortage of Dentists

As argued on various occasions throughout this report, the notion of a shortage is a matter of subjective evaluation. It is possible, therefore, for two people to examine the provision of dental services in Ontario and reach different conclusions as to whether a shortage exists. We shall proceed on the assumption that one does exist, and then ask if more extensive use of auxiliaries could alleviate the shortage, and if this would be the best way to meet such a situation. The first problem is to determine what is meant by an auxiliary and just what duties she may be permitted to perform.

For the purposes of this discussion, only two types of auxiliary will be considered: the dental hygienist of Ontario, and the dental nurse of New Zealand or the New Cross auxiliaries of London. The latter form of auxiliary is permitted to carry out a wide range of dental services for school children, including the cutting and filling of hard tissue.

Although there are courses for dental assistants in the new colleges of technology, the only formal training program for dental auxiliaries of any consequence in Ontario is the two-year course for dental hygienists given by the Faculty of Dentistry at the University of Toronto. The Faculty of Dentistry at the University of Western Ontario also intends to introduce a program for dental hygienists. An item of some importance in this discussion is a resolution passed by the Ontario Dental Hygienists Association which calls for the establishment of a four-year degree program.

The clinical duties performed by the hygienist require low-level skills and are strictly delineated by statute. Section 12 of the Dentistry Act establishes the legal

or statutory limitations on the duties which the hygienist may perform. The Board of the Royal College of Dental Surgeons is empowered to pass by-laws to:

> (b) provide for the delegation to dental hygienists of the performance under the direct control and supervision of a member of the College of the services of cleaning and polishing teeth and the giving of instructions and demonstrations in oral hygiene and mouth care;
>
> (c) prescribing other specific dental duties of a minor nature that may be similarly delegated for performance by dental hygienists.[1]

Clearly, the auxiliary permitted to perform only the very limited duties of the hygienist in Ontario can in no way replace the dentist; but she still can be used to relieve a shortage. She can and does release the dentist from the performance of routine duties for which he is over-trained. Thus, to use the terminology developed earlier, she is a substitute rather than a complementary form of auxiliary. She increases the productivity of the dentist, not by helping him perform some duties better or more rapidly, but by relieving him altogether of some duties. In effect, she assumes responsibility for one stage in the treatment of a patient.

Under these circumstances, the extent to which the numbers of hygienists can be expanded profitably is restricted by the productivity of the dentists. If a particular dentist is capable of examining and treating only 1,500 patients per year, this is the maximum number of patients that his hygienist can see.

For the profession as a whole, therefore, the number of hygienists is limited by the ability of the dentists to supervise them. It seems natural at this juncture to ask what the ideal ratio between the number of dentists and the number of hygienists should be. If the hygienist can increase the productivity of the dentist, then it seems more hygienists should be trained. Posing this question precludes an important policy option. The fact that the hygienist increases the productivity of the dentist cannot logically imply that more, or indeed any, hygienists should be trained.

The alternatives are to create and train other forms of auxiliaries, or to train more dentists; at least, this is certainly the case in Ontario. If a shortage of dentists exists, it is not because too few young people are interested in studying dentistry; it is because there are too few places in the faculties of dentistry to train them. Arguments to increase the number of hygienists imply that the facilities must be expanded in terms of faculty, capital and operating expenses. If resources are available to produce more hygienists, the same resources can be used to produce more dentists. Are the available resources best spent on training hygienists, or should they be used to train more dentists? Unfortunately, there is not enough empirical evidence to give a definitive answer; but there are some pertinent observations that indicate further investigation of the subject is necessary.

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[1]The Dentistry Act, Revised Statutes of Ontario, Queen's Printer, Toronto, 1961.

From the point of view of training or investment in training, the relative productivity of the dentist and the hygienist cannot be measured simply in terms of the contribution that each makes to the supply of dental services while actually on the job. This is only one element of the return on the investment in training. The other very important element is the length of the working life.

Since there is an abundant supply of applicants to dental schools, the actual net cost to society of training a dentist is the cost of his dental education which now spreads over four years. Under these supply conditions, the cost of his pre-dental education is not part of the cost of producing a dentist. Thus in meeting a supposed shortage of dentists, the option is between training dentists over four years and training hygienists over two years. Certainly, with the same resources more hygienists could be produced in any year than dentists, but the pool of hygienists would not necessarily grow faster than the pool of dentists. One reason is that the working life of the hygienist is probably less than half that of the dentist.

The disparity between the incomes for dentists and those for hygienists, together with the fact that there are fewer hygienists than dentists, leads directly to the conclusion that the dentist, per working hour, is more productive than the hygienist. While there are no reliable data for Ontario, it is obvious that the hygienist's career is likely to be interrupted by marriage and child-bearing, and that in many cases she is likely to leave her profession after only a few years of service. Inspection of the 1966 Survey suggests that there is a fairly large proportion of hygienists who are working part time. These observations call into question the wisdom of diverting resources from the training of dentists to the training of hygienists.

Of course, much of the doubt about the productivity of the hygienist would be dispelled if her working life were as long as the dentist's. If hygienists were generally male rather than female, the working life of the hygienist would more nearly approximate that of the dentist.

During field interviews in the United Kingdom, the only significant criticism the author heard of the experimental New Cross auxiliary was some misgiving as to whether the training of a large number of these auxiliaries was economically advisable. It seemed that in proposing experimentation with new forms of auxiliaries, so much debate focused on their impact on standards and whether they could be trained to perform the duties proposed for them, that proper consideration was not given to the costs and benefits of training them.

The New Cross auxiliary, like the New Zealand dental nurse, is designed to provide a rather different service from the hygienist. Although the conditions of supervision and the range of services differ, both these auxiliaries are intended to provide dental care to school-aged children. The question regarding the efficacy of training auxiliaries in large numbers applies to this type of auxiliary as well, although with diminished force. If the duties of the auxiliary are expanded so that

she more closely approximates the dentist, the discrepancy in their productivity also will diminish.

A further important fact about dental nurses is that their numbers are not limited by the number of dentists who can directly oversee their operations. The New Zealand dental nurse has a considerable measure of independence; this results not only from her training but from the whole program of dental health care for children of which she is an essential part. She is different in this important respect from an auxiliary employed in private practice: the conditions of her practice are determined directly by public policy. She is restricted to school-aged children who have met with certain specified preconditions. Thus, she is in direct competition with dentists in the treatment of patients. She is restricted, however, from establishing a private practice.

The use of this type of auxiliary should be the subject of considerable study. In the initial stage, however, the study should concern itself less with whether an auxiliary such as the New Zealand dental nurse can perform the duties claimed for her, and more with the economics of her use in the provision of public dental health services. The direct involvement of this type of auxiliary in the comprehensive treatment of the patient seems to be a more effective way of combatting any assumed shortage of dentists. The training period for the New Cross auxiliaries is two full years, somewhat but not appreciably longer than the two academic years of training that the hygienist in Ontario receives.

The introduction of an auxiliary such as the New Zealand dental nurse would require major changes in public policy. Our concern here, however, is whether, under the present structuring of the profession and in the absence of public programs, it is possible for the profession to absorb a significant number of auxiliaries. It was shown in Chapter 4 that a high proportion of the practices in the province did not employ any form of auxiliary, not even a chairside assistant. The evidence provided by the 1966 Survey suggested that the size of the private practice was probably the limiting factor in the employment of auxiliaries, and that the dentist whose practice was growing naturally turned to auxiliaries to help cope with the increased patient load. It is particularly significant that, in the rural areas where the shortage of dentists is supposed to be most severe, practices are typically small. This suggests that if larger numbers of hygienists were trained they would be unlikely to find employment in rural areas. We found no evidence, however, that *relative* to urban communities the "shortage" is more severe in rural areas.

That auxiliaries, meaning Ontario hygienists, are expedient means of eliminating a shortage of dentists is a highly questionable view. From this it must not, and cannot, be inferred that we question the value of the hygienist. What is at stake is the proper mix of dental personnel. The hygienist has a valuable role to play, but it is not that of alleviating the shortage of dentists.

Training Requirements for Auxiliaries

The advantage of an auxiliary, however her duties may be delineated, is that she can be trained either in greater numbers or at lower costs than can the dentist. If neither of these conditions is true, it is more sensible simply to train more dentists. The absolute length or cost of the training period is less important than is the length or cost of the training period compared to the length and productivity of the working life. It is desirable therefore to adopt measures to ensure both a long and productive working life, and as short and inexpensive a training period as is commensurate with the duties the auxiliary is expected to perform.

The training period for the Ontario hygienist is currently two academic years at the Faculty of Dentistry of the University of Toronto. In a resolution that must be viewed with some concern, the Ontario Dental Hygienists Association has advocated a four-year degree course in dental hygiene. This is the length of time it takes to train a dentist. In terms of the duties which the hygienist is permitted to perform under the Dentistry Act, even the two-year training period seems excessive.

Indeed, in view of the very limited functions of the hygienist, a comprehensive study of the profession must question the efficacy of the two-year training period. It has been found in other countries that within a two-year training period an auxiliary can be taught to successfully perform a far wider range of duties than those expected of the hygienist. Controlled experiments undertaken by the Royal Canadian Dental Corps have shown that it is possible to train auxiliaries to perform the duties of the hygienist in a matter of weeks.[2] The experiments conducted at the New Cross Hospital in London indicated that within two years an auxiliary could be trained to cut and fill hard tissue, and to perform a number of other dental duties. The New Cross auxiliary works solely on children and under the direct supervision of a fully qualified dentist.

The New Zealand dental nurse performs a complete range of dental services for school-aged children; she does not work under the direct supervision of a dentist but normally is able to consult one if she wishes. The training of the dental nurse is similar to that of the New Cross auxiliary.

> The training period for the dental nurse is two calendar years including about eight weeks' vacation each year. . . . A scheme of a total of 1,608 hours is spent on this course; 824 hours for the first year, divided into 294 hours of lecture and 530 hours of laboratory instruction; and 784 hours for the second year comprising 84 lecture hours and 700 clinical hours.[3]

The evidence from the Royal Canadian Dental Corps, the experiment with the New Cross auxiliaries, and the long and successfully established New Zealand

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[2]K. M. Baird, G. R. Covey and D. H. Protheroe, "Employment of Auxiliary Clinical Personnel in the Royal Canadian Dental Corps", *Journal of the Canadian Dental Association,* April 1967, pp. 184-191.

[3]J. T. Fulton, *The New Zealand Dental Health Plan,* United Nations, Geneva, 1960, p. 34.

dental nurse suggest that, for the duties which she is expected to perform, the Ontario hygienist is overtrained. In the course of interviews undertaken in Ontario the author encountered some very cautious and conservative attitudes with respect either to shortening the training period or to expanding the hygienist's duties. Apparently, it is assumed that the quality of dentistry in the United Kingdom and New Zealand is somewhat different from that in Ontario or that "conditions" are different. Fortunately, a highly respected body very close to home has also wondered if the training period for hygienists is not too lengthy. In its final report, the Commission on the Survey of Dentistry in the United States noted that:

> Although the Commission is sympathetic with the desire to improve the educational experience of the hygienists, it appears that the two-year curriculum for hygienists may be over-educating them for the services most hygienists actually perform. The two-year program should permit hygienists to acquire a background that would enable them to perform a number of services, under the direct supervision of a dentist, comparable in degree of responsibility to those entrusted to nurses. . . . Certainly, two years of training are not needed to prepare for the cleaning and polishing of the exposed surfaces of the teeth. Dental corpsmen in the Armed Forces are trained within a few weeks to provide this service.[4]

The Faculty of Dentistry of the University of Toronto has facilities for training fifty hygienists each year or an enrolment in any one year of 100 students in dental hygiene. Provision is to be made at the University of Western Ontario for an enrolment of a total of forty students, twenty in each year. In view of the limited facilities for training hygienists, it would seem that urgent consideration should be given to shortening the training period for dental hygienists. The alternative is that consideration be given to widening the scope of their training and to making appropriate amendments to the Dentistry Act to permit a wider range of services to be performed by them.

Some thought should be given also to just where hygienists should receive their training. Currently, all hygienists are trained at the University of Toronto. The proposed new school also will be situated in a university. In view of the limited and restricted range of duties to be performed by the hygienists, and the low level of skill required for them, university training seems an unnecessary extravagance. It seems reasonable to suppose that the hygienist could receive a perfectly adequate training within the context of the new Colleges of Technology.

Effect of Auxiliaries on Standards

One of the dangers of replacing very highly trained personnel by personnel with lower skill levels or less comprehensive background knowledge is that the quality of the service rendered may deteriorate. Fears of this apparently have arisen in the case of the dental auxiliary. For example, interviews held in England showed that some dentists doubted that auxiliaries could perform some of the duties

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[4]B. S. Hollingshead, *Survey of Dentistry*, American Council on Education, Washington, 1960.

claimed for them on the basis of the training they were to receive. The New Zealand dental nurse has been an object of skepticism for dentists, both at home and around the world.

Whether or not an auxiliary will lower the quality of service depends upon four factors: the specification of the duties to be performed, the type and length of training for the proposed duties, the selection of the personnel to be trained as auxiliaries, and the supervision under which the auxiliary actually practises.

Studies have been conducted on the quality of the services provided by auxiliaries under actual conditions of practice. J. T. Fulton in a study of the New Zealand dental nurse finds nothing lacking in the quality of the services which she provides.[5] The experiments conducted by the Royal Canadian Dental Corps with a wide range of auxiliaries indicate that it is possible to maintain the quality of services.[6] Last is the evidence from the training of the New Cross auxiliaries which suggests that an auxiliary can indeed be trained to provide a high quality service. There can be little doubt that it is possible to design a training program and specify conditions under which the auxiliary will operate so that the quality of service will be maintained.

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[5]J. T. Fulton, *op. cit.*

[6]K. M. Baird, *op. cit.*

Chapter 6 Public Health Aspects of Dentistry

This chapter presents a brief inquiry into the public health aspects of dentistry, and attempts more particularly to consider the role of the state in attacking the dental problem.

The Problems

Dental public health may be defined as the science and art of preventing and controlling dental diseases and promoting dental health through organized community effort. In broad terms, there are four points of concern to the public health dentist.

Demand for Dental Services

First, the individual's demand for dental treatment is small relative to the medical need for it. The idea of dental care as a luxury good rather than a necessity is reflected on the one hand in the widespread public apathy towards dental disease (wherein the loss of teeth is considered a natural part of the aging process), and on the other hand, in the elective nature of most dental treatment. Indeed, because catastrophic illness or the fear of death seldom accompanies dental diseases and because the crippling effects of edentualism (toothlessness) are generally accepted as inevitable, major dental care is highly elective. Of the four main areas of dental concern — dental caries, periodontal disease (both of which ultimately affect over 95 per cent of the population), malocclusions (which affect approximately one-third of all children), and congenital oral clefts (which occur in one of every 750 childbirths) — only the latter are really non-elective. True, all may be expensive; but the first three do not usually create the acute socio-psychological anxieties, the social stigma, or function fears that would stimulate corrective or preventive care.

Further, diseases like oral cancer are included in the category of medical diseases, even though they may properly be diagnosed by a qualified dentist. In any event, the economic catastrophe attributable to these conditions will result not from the dental treatment, but from subsequent hospital and medical costs.

The two factors which are independently related to, and have an important bearing upon, the frequency with which dental care is sought are family income and the education of the family head. Education is related to the demand for dental care, largely because it is the better educated person who is more likely to appreciate dental health and seek the services to attain it. Real income is related

to the demand for dental care not only because of the obvious cost consideration, but also — and perhaps more importantly — because income level reflects a standard of living and a pattern of personal values which determine an individual's attitude towards dental treatment. It is not surprising, therefore, that with the steady advance in educational levels and the steady rise in real income over the past few decades the demand for dental treatment has increased significantly. According to American Dental Association estimates published in the American Survey of Dentistry,[1] only 20 to 25 per cent of the total population visited a dentist prior to 1930, but by 1949 this figure had increased to 40 per cent and by 1955 to 45 per cent. Between 1935 and 1958, individual purchases of dental care, corrected for price changes, rose from $3.49 to $7.43 — an increase of 114 per cent or 17 cents per annum. It seems safe to assume that this trend will continue, although perhaps at a decreased rate.

In the context of the voluntary health system that exists in Ontario, more education and higher incomes may be the major stimulants of better dental care. Additional contributing factors would be modern means of communication, the modern emphasis on good health care, improvements within the profession itself and the recent interest of all levels of government in health services.

Shortage in Rural Areas

A second point for the public health dentist to consider is that the dental problem is far more acute in rural areas than in urban centres. Field studies indicate that the relative scarcity of dental services in the largely rural and semi-isolated areas of Ontario is one of the most serious health problems in the province. The problem is not confined simply to an insufficiency of dentists; it is compounded by the negative attitudes that insufficiency breeds towards dental treatment and modern preventive measures. This in turn discourages dentists from moving into these areas. That the situation is not likely to improve is made demonstrably clear by R. Grainger's study of 1963 graduates.[2] Only 10 per cent of the 1963 graduating class of the University of Toronto Faculty of Dentistry came from centres of 10,000 and under, and of these only 43 per cent planned to return to a similar community. Of students from centres whose population is between 10,000 and 100,000, 13 per cent intended to practise in smaller areas, 68 per cent in similar sized areas, and 19 per cent in larger areas. Of students from centres whose population exceeded 100,000 over four-fifths return. Of course, the whole problem is inextricably tied up with education. The proportion of university students from rural areas is only about one-third the proportion coming from urban centres. In any event, rural Ontario is an area of special concern which demands special attention to combat the dental health problems inherent

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[1]B. S. Hollingshead (ed.), *Survey of Dentistry*, American Council on Education, Washington, D.C., 1966, p. 253.

[2]R. Grainger, "The Origins of Dental Students", *The Journal*, Ontario Dental Association, Vol. LXII, p. 93.

there. In the Hastings-Mosley study of *Organized Community Health Services*[3] prepared for the Hall Commission, the authors recommended that a salaried dental service be established to attract new graduates to work for a time in rural and northern areas.

Limited Resources

Because the personnel and money available for health programs are always limited, it is important to determine the type of programs that will do the most to improve oral health conditions. For this reason, it can be argued that the community should begin with and concentrate upon dental care for children, and that preventive and educational activities usually should be given priority over treatment programs.

But at the same time one must keep firmly in mind that the key to improving dental health is individual motivation. Even if a mouth has been restored to health by treatment, neglect of proper oral hygiene and failure to seek further professional services soon will reduce the mouth to its former condition. When this occurs in a public dental health program the expenditure of community funds may be considered largely wasted. Yet, no effective action can be taken in the first place to improve oral health conditions unless the public furnishes sufficient funds for the task at the outset. Therefore, in the long run and in its broadest context, the solution of the dental health problem requires a reappraisal of the value of dental services. The individual must believe it to be as important a health issue as cigarettes or alcohol. The community must recognize that adequate dental service may be as essential and valuable as more physical projects such as civic auditoriums, or recreation programs.

A true demand for dental services can be said to exist in a community if the community is willing to pay all or part of the costs to take any other necessary collective action to facilitate the rendering of such services by a dentist.[4] Moreover, as the demand for community dental services nearly always arises from the dental care needs of children, a continuing voluntary committee on dental care for children is an excellent indication of a significant collective interest.

Organization

If adequate dental public health activities require organized community effort, this in turn implies an adequate organization apparatus, to make the most efficient

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[3]J. E. F. Hastings and W. Mosley, *Organized Community Health Services,* Royal Commission on Health Services, Queen's Printer, Ottawa, 1966, p. 52.

[4]During interviews it was pointed out to the author by Dr. Minton, who for some years has been concerned with the placement of graduating students, that communities with an awareness of the need for a dentist will sometimes go to extraordinary lengths to attract one. He can provide convincing evidence that a concerted community effort to attract a dentist can be successful.

use of the limited financial resources available. Some of the problems in this area were succinctly summed up by the American Survey in Dentistry:

> In summary, local health department dental programs with some outstanding exceptions are widely scattered, thinly spread, inadequately staffed with poorly paid personnel and primarily clinical in nature.[5]

The Ontario Department of Health

History and Organization

At the time of Confederation, health was thought to be essentially a private and personal matter; therefore, it was not specifically enumerated in the division of powers between the Dominion and the provinces in Sections 91 and 92 of the British North America Act. Provincial responsibilities in matters of health arose from the power of the provinces to make laws in relation to matters of local concern (Section 92 (16)). The province accepted these responsibilities by enacting legislation in the field of public health following the English Public Health Act of 1875. Provincial functions in these formative years were of a general regulatory and supervisory nature; there were no full-time provincial departments of health. Now, of course, all provinces have well-established departments responsible for public health matters.

At the federal level the formal beginnings of a Department of National Health and Welfare took place in 1919, but it was expressly stated that the Department should not exercise any jurisdiction or control over any provincial or municipal board or other health authority operating under the laws of any province. In the key year of 1945 a dental health division was established in the Department and a diploma course in Dental Public Health was begun by the University of Toronto School of Hygiene.

The first dental division of a provincial health department was established in the Ontario Department of Health in 1925. Under the present organizational framework, the Dental Services Division is part of the Local Health Services Branch of the Department. Headed by a senior consultant in Public Health Dentistry, its functions are basically:

1) to provide administrative and consultative service within the Department and to other departments of government, such as the Department of Public Welfare, the Department of Reform Institutions and to local public health agencies;

2) to engage in conventional dental public health activities, including liaison service with other departments of government, local health authorities, dental organizations and the public;

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[5]B. S. Hollingshead, *op. cit.*, p. 276.

3) to direct and supervise dental services in each of the twenty-one mental hospitals administered by the Ontario government, as well as in the Central Dental Laboratory;[6]

4) to direct and supervise the railway dental clinics;

5) to administer school dental service grants to local health authorities.

In 1965-1966, the expenditures of the Dental Division accounted for about .04 per cent of the total Ontario Department of Health expenditures. This amount was not significantly different from the 1964-1965 figures.[7]

The establishment of well-developed provincial health departments has led most provinces to provide local public health services directly (except in the case of large cities). In Ontario, however, local autonomy in the provision of local services has prevailed (although the 1967 Report of the Department of Health recommends the establishment of twenty-nine district health units across the province).

The Public Health Act of Ontario requires every municipality to appoint a local board of health. Where two or more municipalities have agreed to form a health unit, a board of health for the entire area is appointed. The duties of a board are, in general, to ensure the carrying out of requirements of the Public Health Act, the regulations thereunder, and any county or municipal by-laws on public health. Local boards of health are almost wholly autonomous in Ontario.

A dental public health officer (preferably with a diploma in Dental Public Health or its equivalent from a university school of hygiene or public health) is not a basic member of a board of health staff, but some municipal health departments or health units employ one on either a full-time or part-time basis. Most programs also obtain the part-time services of local dentists on a fee arrangement basis to assist in clinics or school programs.

Several factors deter the more extensive use of dental public health officers. Many local municipalities are reluctant to employ one from a purely financial point of view. Generally, special staff members are paid partly through National Health Grant funds; if the grant is terminated a local board may cease to employ its dental public health office. The resulting uncertainties of tenure and income level deter both the recruitment and the retention of such personnel. Often the size of the population served by a health unit is insufficient to warrant the employment of special staff on a full-time basis, even though their services would be useful.

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[6]The Ontario Hospital Dental staff in 1967 numbered twenty-two full-time dentists, twenty-two full-time assistants, three part-time dentists, three part-time assistants, and one dental technician.

[7]*Public Accounts of the Province of Ontario, 1966,* Queen's Printer, Toronto, 1966, pp. 13, G. 19.

Classification of Dentists in the Civil Service

Basically, there are two classes of dentists in the civil service. Their initial salary and salary with yearly increments are shown in Table 13.

TABLE 13
Civil Service Dentists' Salaries

	1	2	3	4	5	6	Part time
Dentist Class 1	$8,600	$9,000	$9,500	$10,000	$10,500	$11,000	$34.50 per day
Dentist Class 2	11,500	12,000	12,500	13,000	13,500	—	45.00 per day

SOURCE: Ontario Department of Health.

A dental assistant begins at $4,313 and after two annual increases of $170 may rise to $4,653.

In 1967 a new class of specification was created — "Advisor in Public Health Dentistry" — with a salary of between $14,500 and $18,000, based on one $500 increment and three $1,000 increments. He, "in general, acts as the departmental authority in the total field of dentistry" and must have the following qualifications:

1) a doctoral degree in dental science and a diploma or degree in Dental Public Health;
2) at least five years of experience in directing a dental health program or an acceptable equivalent;
3) proven administrative ability.

Dentists' salaries in the civil service appear to be competitive, at least at the top levels. There are certainly two strong points to be made. First, a civil servant dentist has no overhead, equipment, turnover, office rent, or administrative expenses. Assuming a normal overhead of between 40 and 45 per cent of gross income, a private practice dentist must earn at least $24,000 just to draw level. Second, a civil servant dentist has the tremendous non-financial advantage of regular hours.

The Provision of Dental Services

General Welfare Assistance Act

Section 9 (n) of the General Welfare Assistance Act (R.S.O. 1960, c. 164) stipulates that the Lieutenant Governor in Council may make regulations "providing for the whole or part of the cost of providing medical and dental services to recipients of assistance and their dependants or any class thereof". In fact, Regulation 207, s. 34 (R.R.O. 1960) under the Act conditions this provision in two ways — assistance is limited to emergency extractions only and the Ontario government reimburses the municipality to the extent of 80 per cent of the cost.

Ontario Dental Welfare Plan

This plan, begun in 1958, arises from a contract between the Department of Public Welfare of the Government of Ontario and the Royal College of Dental Surgeons; the plan is administered by Canadian Dental Service Plans Incorporated. Essentially, under the contract the profession agrees to provide certain basic dental treatment services to designated beneficiaries of the department on the basis of a monthly grant. Presently the contract calls for payment by the province of 90 cents per eligible beneficiary per month; the eligible beneficiaries are those included under the General Welfare Assistance Act. Dentists in turn are remunerated at the rate of 90 per cent of the Ontario Dental Association fee schedule (though in the past they have had to accept pro-rating of fees as low as 66 per cent in order to keep the plan solvent). The patient has a free choice of dentist; and the dentist for his part may choose to accept or not to accept the beneficiary as a patient. Altruism aside, there is little inducement for dentists to accept these beneficiaries and trouble has been experienced in attracting dentists to participate in the plan. Not only must they sacrifice their own practice to a certain extent, but they must do so at less than their normal fees and with added bookkeeping as well.

Who are the designated beneficiaries? Originally the plan supplied dental care only to children of beneficiaries under the Mothers and Dependent Children Allowances Act (R.S.O. 1960, c. 247). Regulation 448 under that Act (R.R.O., 1960, S. 21 (2)) "Medical and Dental Services" provided that:

> . . . a beneficiary under 16 years of age, other than a beneficiary who is an Indian and eligible for dental services under the Indian Act (Canada), is entitled to dental services provided under any agreement in writing in force from time to time between the Crown in right of Ontario and the Royal College of Dental Surgeons.

Since 1960 two changes have occurred, one nominal and one of substance. First, in 1963 the name of the Act was changed to the Mothers' Allowance Act and in 1966 to the Family Benefits Act. Second, the scope of the Act has been enlarged to include first beneficiaries under eighteen years of age (see Ontario Regulation 21/1963, s. 19 (2) revoking Regulation 448 (R.R.O., 1960)), and then in 1965 to include all beneficiaries under the Act (see Ontario Regulation 98/1965). About 40,000 persons per annum are now eligible for this service.

The Dental Services Committee of the Ontario Dental Association, which is charged with the study of the administration of plans, wants to expand the welfare benefits in two directions. It would like to extend the type of service to include the full range of dental care, save elective services of a cosmetic nature; and to extend the range of beneficiaries to include the blind, those receiving old age assistance, widows and disabled persons. At present these groups are covered

for medical services but not dental services (see, for example, Disabled Persons Allowances Act).[8]

Exclusion of Dentists from Health Plans

Several possible reasons may be offered for the exclusion of dental services from any type of medical insurance plan.

1) No feasible premium schedule has yet been worked out, the major difficulty being that the range of fees for basically the same operation is so wide (for example, an extraction may cost anywhere from $4 to $400). Doctors, on the other hand, have well-established plans and probability scales drawn up.

2) Not everyone in the population will require hospitalization or major medical care in any one year. Therefore, a program that is actuarially sound in medical insurance does not presuppose lack of utilization in the presence of concrete need. Quite the contrary, medical insurance is based upon the spread of the risk over large population groups. The situation is totally different in dentistry where the estimates of need (risk) range from 90 to 95 per cent of the population.

3) Furthermore, there is a tremendous backlog of accumulated dental needs not present in a comparable sense in medicine. Dental insurance programs would promote increased dental care for the total group. In view of the shortage of dental manpower, facilities would be overwhelmed if everyone who became eligible were to seek care immediately. One would have to ration services until the backlog of the newly stimulated demand could be eliminated.

4) In a real sense, dentistry is still viewed as a luxury good rather than a necessity, and this can lead to results which are basically discriminatory. The treatment by dentists of broken jaws, oral infections and several similar ailments is provided for in the Dentistry Act, but there is no insurance payment for them — that is, many services which can be rendered by a dentist as well as by a physician (for example, the overlapping area of oral surgery) are paid for only if performed by a physician. Not only is this discriminatory, it is logically untenable, and in the last analysis is a denial of public access to health services.

5) Dental disease is normally characterized by the lack of catastrophic illness, and the lack of any fear of death. Even a disease like oral cancer (which may be treated by a qualified dentist but is normally

[8]R.S.O. 1960; R.R.O. 1960, Reg. 114, s. 6; Old Age Assistance Act, R.S.O. 1960; R.R.O. 1960, Reg. 457, s. 5.

considered a medical illness) does not generate a fear of death. The absence of a reasonable risk of incurring a non-elective catastrophic dental illness which would not be covered by usual medical insurance is one of the chief reasons for the delayed growth of these plans in dentistry.

School Dental Programs

According to the American Survey on Dentistry,

> . . . any adequate dental health program for children must involve the schools . . . a complete dental health program for school age children must ensure effective instruction in dental health; a minimum of one thorough dental examination for each child; the use of preventive measures, particularly the fluoridation of water or application of topical fluorides; and complete treatment of all dental defects. In most cases these objectives could be accomplished only by cooperative efforts of the dental society, the schools, the health department and other community agencies. In practice, communities in which all of these services are provided are rare.[9]

In Ontario, under S. 96 (2) of the Public Health Act (R.S.O. 1960, c. 34) "a school board may enter into an agreement with the local board of a municipality or health unit to provide for the medical and dental inspection and dental treatment by the local board of the pupils of the school or schools under the charge of the school board". Regulation 508 under the Public Health Act then provides for a provincial school dental service grant amounting to either 20 per cent of the cost of dental inspection where the population under the jurisdiction of the local board exceeds 15,000, or 30 per cent of the cost where the population is under 5,000 or a township is involved. In neither case is the total grant paid to a local board in any one year to exceed $2,000. There are two major difficulties involved in this kind of arrangement. Unless the community is quite small, the grant does not make possible extensive service. Furthermore, the community must somehow provide the other 70 per cent of the costs from local tax sources. In practice, only relatively few communities, usually the larger municipalities, can take advantage of the grant.

The school dental programs themselves vary widely from a superficial inspection by the school nurse, who sends referral notes to parents where care is indicated, to programs with dental public health officers and dental assistants. Direct treatment, however, is generally given only to children from low income families. A striking exception to this broad picture is found in North York Township where a complete examination and treatment service is provided for all children of parents who desire it (see Appendix III).

Ontario Government Bursary Plan for Dental Students

Under this plan the Ontario government provides a bursary of $1,000 per year for a maximum of three years. In return the student agrees to enter general

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[9]B. S. Hollingshead, *op. cit.*, p. 183.

practice in a location where there is a proven need for dental services. During his final year of schooling, the bursary holder selects the location from an approved list prepared jointly by representatives of the Ontario Department of Health, the Royal College of Dental Surgeons, and the faculties of dentistry. He fulfils his return-in-service on the basis of one calendar year for each academic year of bursary assistance. In 1962-1963 six students took part in the plan, but by 1965-1966 the number had increased to thirty-three. As an attempt to provide rural and outlying areas with a resident dentist, however temporary, this incentive plan has obvious merit. It is not known, however, how many of the dentists remain as permanent residents in these locations.

Dental Railway Cars

Ideally, from a community's point of view, the most efficient and satisfactory way yet devised to provide dental services for any area is through a resident dentist who becomes an integral part of the community. A dentist who is either "serving his time" to fulfil bursary or other conditions, or who comes on a periodic visiting basis never becomes a member of the community in quite the same way.

It is obvious, however, that this ideal cannot be fulfilled in the most northerly and isolated areas of the province. Alternative methods must be sought to supply these areas with dental services. The idea of the dental railway cars was developed to meet this need.

The Ontario Department of Health now operates two of these cars — one on CPR tracks and one on CNR tracks — to provide dental care to children living in remote communities in the northern parts of the province. Each car is staffed by a dentist, with his wife acting as chairside assistant. Service on the car donated by the CPR was begun in 1931. Avoiding towns and sections where there is a resident dentist, it travels some 1,100 miles in eleven months. In 1966 it stopped in six locations and rendered treatment to 1,039 children. The CNR car was introduced in 1951 and covers a route of 1,585 miles from Goodwin on the Quebec border to White on the Manitoba River, and from Capreol to Rainy River. In 1966 it stopped at eight locations and 1,200 children were treated. In addition, the Red Cross voluntarily operates three dental coaches.[10] The dental cars are a great improvement on the itinerant dentists who used to travel to remote localities with light transportable equipment. But children in the areas covered by the cars are able to be examined only once every two or three years. Further, as the years go by, it is becoming increasingly difficult to secure the required personnel. Even by raising the salary, it is hard to encourage dentists, recent graduates included, to abandon city life. Also, there has been an increased demand for dental coaches, particularly from towns and villages that once had resident dentists.

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[10]Under an agreement with the Royal College of Dental Surgeons that they will not be stationed within 25 to 30 miles of a resident dentist.

Appendix III

Results of Hastings-Mosley Field Studies for the Hall Commission[1]

Peterborough[2]

Peterborough at one time had a school health service operated by the Public School Board, but this was subsequently replaced by the present program, based on a general agreement with the Board of Health. The Peterborough Public Health Department has a full-time staff of seventeen and a part-time staff of one, none of whom, however, qualifies as dental staff. One of the unsettled questions is that of a school dental service. The Public School Board previously employed a dentist to carry out a survey and to provide treatment for children from needy families, the others being referred for care. This service was discontinued under the new agreement with the Board of Health, partly because the former incumbent had retired and partly because of uncertainty as to the desirable kind of program. Presently, pre-school and pre-high school letters sent to parents recommend a dental examination, but the schools would like to have the detection and education service reinstated.

There are two aspects of official welfare programs which deserve mention. First, under the General Welfare Assistance Act, the province shares costs only for emergency extraction. Thus, children of parents on public assistance, both of pre-school and school age, can get preventive care only through private arrangements made with dentists for free care, or through payments by interested service clubs in the municipality. Second, children under sixteen years of age, whose parent is receiving the Mothers' and Dependent Children's Allowance, receive a dental card entitling them to dental care paid for by the province at established fees. There has been difficulty in finding dentists in Peterborough who will accept these cards, since the fees paid are below the usual charges made. The Peterborough Children's Aid Society has so far been able to arrange dental care for its wards.

There are thirty dentists in the area, one in the Peterborough Clinic and the rest working singly. They apparently are a well-organized group. In 1962

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[1] J. E. F. Hastings and W. Mosley, *Organized Community Health Services,* Royal Commission on Health Services, Queen's Printer, Ottawa, 1966.

[2] *Ibid.,* Appendix I, City of Peterborough Field Study, esp. pp. 182-184, 187.

they carried out an extensive effort to have a fluoridation vote carried but were defeated.

Huron[3]

Huron County has a full-time health unit (started in 1949) providing services for its sixteen townships, five towns (of which Goderich is the principal centre), and four villages. The staff of the Huron unit numbers fourteen full-time and eleven part-time employees, but none of these is dental staff.

There are ten municipally operated public water supplies in the county, none of which is fluoridated. Attempts to have fluoridation introduced in Goderich have been unsuccessful so far.

Two school boards have an arrangement for examination and treatment for all pupils in local private dentists' offices. Thirty per cent of the cost is rebated by the province through the Board of Health to these school boards. The other areas, however, have no school dental program other than general health education. The health unit sends a letter to the parents of children who are about to start school and who live outside Goderich recommending, among other things, a dental check-up; but there are no special arrangements for children whose parents do not follow the recommendations. In most school board areas, therefore, the absence of a preventive dental program is a serious health problem, particularly since children of parents on public assistance are covered for emergency extractions only. In actual practice, it is necessary to find either service clubs willing to assist financially in obtaining care, or private dentists willing to render treatment free or at a reduced cost.

There are only eight active dentists in Huron county and none is a specialist. They have heavy work loads and long waiting lists. Some will give only emergency care to people who come to them from outside their own environs. Under these conditions, it is difficult both to maintain practice standards and to obtain care for low-income families. The problem is compounded because the area has difficulty in obtaining even enough dentists to replace those who retire or die; this, in turn, hinders any kind of preventive dental program by the health unit. The health unit has been actively cooperating with the provincial dental organizations and the University of Toronto Faculty of Dentistry in an endeavour to ameliorate the situation.

Timiskaming[4]

The Timiskaming Health Unit provides full-time public health services for some 47,344 persons in seventy-five of the unincorporated and unorganized municipalities in the district. It has a full-time staff of twenty-two and a part-time staff of two; again, none is dental staff.

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[3]*Ibid.*, Appendix II, Huron County Field Study, esp. pp. 231-236, 241.

[4]*Ibid.*, Appendix III, District of Timiskaming Field Study, esp. pp. 275-276, 283.

There are nine municipally operated public water supply systems in the area, of which two — those at Kirkland Lake and Swastika — are fluoridated.

A major problem in the district is the need for some type of organized school dental program, for there is a tremendous backlog of dental caries and bad teeth, particularly in the far northern area. At one time the Red Cross in conjunction with the health unit provided a dentist in one school for all area students, but this arrangement was abandoned about ten years ago. Therefore, the only actual dental supervision is by a public health nurse who does a rapid survey only. Needy child cases are referred to service clubs to pay for such care as they may require. Care for children under the supervision of the Children's Aid Society is paid for by the municipal Departments of Public Welfare; but again these departments will pay only for extractions and not for general corrective work.

There are only eleven dentists in the area; several of these are older and only partly active men, and none is a dental specialist. Since recruitment of younger dentists has not kept pace with those lost by retirement and death, waiting lists are long. Some dentists have had to restrict themselves to offering full service only to people in their immediate areas. At present, the shortage is particularly acute in the tri-town area of New Liskeard, Haileybury and Cobalt, where three dentists (one of whom is semi-retired) must serve a surrounding population of about 25,000.

The Ontario government and Red Cross dental railway cars come to the outlying parts of the district every few years, but these services have been curtailed in recent years because of an inability to obtain sufficient dentists to man all of them.

Metropolitan Toronto[5]

In Metropolitan Toronto there are twelve appointed Boards of Health — eleven are municipal boards and one is the Board of the East York-Leaside Health Unit. The make-up of the staff may be summarized in the following table.

A school dental service employing dentists on a full-time basis is provided by the local health departments in five of the six municipalities which have full-time public health services. Two of the six municipalities with part-time services employ dentists on a part-time basis for their school dental services. The most common school dental program provides routine dental examinations and dental education. Treatment usually is limited to dental emergencies occurring while the child is in school, and to the care of children who are wards of the Children's Aid Societies or whose parents are in receipt of public assistance. The smaller municipalities in Metro refer children from low income families who require treatment to the clinic of the University of Toronto Faculty of Dentistry. The clinic takes only those patients who would be good teaching material. It is not

[5]*Ibid.*, Appendix IV, Metropolitan Toronto Field Study, esp. pp. 312-315.

TABLE A3

Staff by Categories, Metropolitan Toronto

	Total staff		Dentists		Dental hygienists		Dental nurses	
	Full time	Part time	Full time	Part time	Full time	Part time	Full time	Part time
York	45	16	—	11	—	—	—	—
North York	72	65	7	22	—	—	—	—
Etobicoke	42	9	—	—	—	—	—	—
Scarborough	71	3	1	—	1[1]	—	—	—
East York-Leaside	33	9	—	1	—	—	1	—
Mimico	—	5	—	—	—	—	—	—
New Toronto	3	3	—	—	—	—	—	—
Weston	3	2	—	—	—	—	—	—
Forest Hill	6	6	—	2	—	—	—	—
Long Branch	1	4	—	—	—	—	—	—
Swansea	1	5	—	1	—	—	—	—

	Total staff		Dentists		Dental hygienists		Dental assistants		Dental technicians	
	Full time	Part time	Full time	Part time	Full time	Part time	Full time	Part time	Full time	Part time
City of Toronto	514	139	10[2]	29	3[3]	—	1[4]	28[5]	11	—

[1]Two vacancies.

[2]Includes one orthodontist.

[3]Five vacancies.

[4]Five vacancies.

[5]Two vacancies.

SOURCE: J. E. F. Hastings and W. Mosely, *Organized Community Health Services,* Royal Commission on Health Services, Queen's Printer, Ottawa, 1966, p. 303.

primarily a charitable service, but rather a teaching unit supported by the university. Waiting periods even for semi-emergency care are several weeks long.

As significant exceptions to this general pattern, there are three large municipalities where dental treatment (save that of a special nature such as orthodontics) is available to all school children at the request and with the permission of their parents. In North York Township this complete examination and treatment service has been provided through an approved additional property tax, the cost of the program amounting to about one-third the total health department budget of $356,893 in 1961.

TABLE A4

School Dental Services in Metro Toronto

Municipality	Full-time health service	No dental health dept. service	Exam. and educ.	Treatment of indigents only	Treatment for all on request
Toronto	x		x		x
Etobicoke	x	x			
North York	x		x		x
York	x		x		x
Scarborough	x		x		
Weston		x			
Swansea			x		
Mimico		By Board of Education			
New Toronto		x			
Long Branch		x			
Forest Hill			x	x	
East York-Leaside	x		x	x	

SOURCE: J. E. F. Hastings and W. Mosely, *Organized Community Health Services,* Royal Commission on Health Services, Queen's Printer, Ottawa, 1966, p. 315.

Fluoridation

That most dental public health programs are quite inadequate is amply demonstrated by an inquiry into the topic of fluoridation. Among the available dental preventive procedures, fluoridation of drinking water is remarkable not only for its simplicity of application, but more importantly for its effectiveness in reducing tooth decay by an estimated two-thirds. Yet, the 1959 Report on Fluoridation of the United States Public Health Service[6] showed that less than one-quarter of the American people were protected by this safe, economical, convenient, mass-preventive measure, and most of these were in large cities. Only 5 per cent of towns with under 2,500 population had fluoridated water supplies. From 1950 to 1965, the first fifteen years during which this preventive measure was available in the United States, only 3,000 communities with a total population of sixty million had adopted the procedure. It has been estimated that at the present rate of achieving fluoridation the goal of 100 per cent fluoridation will not be reached for over a century. Oral health aside, in purely economic terms the potential cost of this delay in water fluoridation measured by the price of treating cavities not prevented by fluoridation is $452 million per annum, as compared to an estimated $65 million per annum to fluoridate water supplies in communities where it would be feasible. Generally, there appear to be two reasons for the refusal of communities to adopt fluoridation. On the one hand, particularly in the big cities, the public has not been convinced of the benefits and of the safety of the technique; there is the corollary proposition that dental public health has been unable to

[6]United States Public Health Service, *The 1959 Report on Fluoridation,* Washington, D.C., 1960.

exert sufficient leadership to step up the campaign. On the other hand, there are a considerable number of communities where the problems are essentially technical or financial; for example, a water supply that is inadequate both in amount and in quality.

The 1961 Report of the Ontario Fluoridation Investigating Committee addressed itself to these problems and arrived at five principal conclusions.

1) The incidence of dental caries in Ontario is a serious public health problem whose adequate treatment is beyond the resources of the dental profession.
2) Neither treatment nor good oral hygiene is in itself sufficient to control the problem — in fact, the reduction of the incidence of dental caries is a problem of prevention, not one of treatment.
3) Fluoridation is effective in reducing the incidence of dental caries, and is not harmful to bodily health.
4) The equipment in use in municipal water systems is mechanically adequate to accommodate fluoridation, and fluoridation will not cause corrosion of water pipes.
5) There should be legislation on the subject with the important proviso that a municipal referendum should not be necessary for the adoption of fluoridation by a local community.

A survey of Canadian fluoridation legislation shows a wide variation in terms. In Newfoundland, Prince Edward Island and Quebec, there does not appear to be any specific legislation dealing with the subject. In Nova Scotia and Manitoba, fluoridation is the decision of the municipal council concerned. In Saskatchewan, it is a decision either of the local councils or of a simple majority of the voting inhabitants of the particular community. In British Columbia, 60 per cent of the local voters must approve the measure. In Alberta two-thirds of the voters must approve, and there is a two-year waiting period between successive referenda. It may be queried whether this built-in bias against fluoridation in our two most westerly provinces is justifiable.

The position in Ontario is governed by the Fluoridation Act (Statutes of Ontario 1960-61, c. 30), and there are two chief provisions. First, a local council can either introduce fluoridation on its own initiative, or choose to submit the question to the eligible voters of a municipality for approval by a simple majority.[7] But, second, if a petition requesting a plebiscite is signed by at least 10 per cent of the electors, the municipality is required to hold such a plebiscite. The Ontario legislation goes part way, but does not wholly adopt the suggestion made by the Fluoridation Investigating Committee that the decision be taken away from the voters. The matter is not easy to resolve, for it entails the larger issues of public

[7]The precise wording of the question as set down in Section 2 (2) of the act is, "Are you in favour of the fluoridation of the public water supply of this municipality?"

involvement in the decision-making process of local governments. One must balance the desirability of local inhabitants participating in local decision-making against the desirability of reserving some questions about which the public is either ill-informed or incapable of reaching a rational conclusion. This consideration ignores a prior one — whether in a system of government by elected representatives a public referendum has any place at all. Such a discussion is beyond the scope of this inquiry.

The results of the attempt to introduce fluoridation into municipal water supplies in Canada unfortunately parallel those of the United States as indicated at the beginning of this section. For example, in 1965 there were seventeen fluoridation plebiscites held in Canada and only in Sherwood Park, Alberta, was the preventive adopted (by a vote of 834 to 166). In Ontario alone, seven communities (Cobourg, Elmira, Fort William, Port Arthur, Lindsay, Peterborough, Port Colborne) cast a decision against fluoridation. The position as of December 31, 1966, is summarized in Table A5.

TABLE A5

Population in Communities with Controlled Fluoridation, 1966

Province	Population, 1966	No. of communities, 1966	Percentage of total pop., 1966	Percentage of total pop., 1961
Newfoundland	6,000	1	1.2	—
Prince Edward Island	—	—	—	—
Nova Scotia	191,200	6	25.1	21.4
New Brunswick	—	—	—	—
Quebec	410,900	35	7.3	2.8
Ontario	3,166,100	36	47.0[1]	3.9
Manitoba	573,300	17	59.6	57.5
Saskatchewan	279,600	76	29.4	19.2
Alberta	76,200	20	5.3	2.4
British Columbia	86,900	12	4.9	3.3
Canada	4,801,800 (includes 11,600 in Yukon and N.W.T.)	208	24.5	7.4

[1]The spectacular percentage increase in Ontario is chiefly due to the fact that Metro Toronto fluoridated its water supply in 1963 and Ottawa did so in 1965.

SOURCE: Canadian Dental Association, *Fluoridation*, 1966.

Part Two: Administration of the Dental Industry

Chapter 7 Introduction

Hidden from the public view is an administrative framework that attempts to ensure the provision of a bewildering complex of health services. This administrative framework and its institutions are seldom seen or encountered by the public for two reasons. Historically, they have deliberately avoided the public gaze; and until recently, the public has expressed little interest in them. These institutions seemed to have become the preserve of an "establishment" which the lay public could not penetrate. Dentistry, however, is perhaps one of the most easily penetrated areas. The relationships are fewer in number, more easily identified, and simpler in nature. The functions and responsibilities of the dental institutions are, like the institutions themselves, fewer in number and less complex than those found in some other areas of the healing arts. For these reasons, some of the problems appear to stand out in bold relief even if their solutions do not.

This part of the inquiry is concerned with the institutions that are responsible in the widest possible sense for the administration of the dental industry, the professional dentist and his auxiliaries. Some of the problems that this administrative framework is intended to solve and ultimately the need for the reform of the administrative framework are discussed here.

Throughout this part of the inquiry, assumptions have been made that may restrict the validity of the comments and the application of the reforms proposed. The most restricting assumptions that must be made are those regarding the institutions which control all parts of the healing arts. These are the institutions which attempt to coordinate the various regulatory and administrative bodies in the healing arts. Unfortunately, for historic reasons, there are some regrettable vacuums in this framework. In some areas, coordination is virtually non-existent. In prescribing policies which would remove the lacunae and the redundancies, definite assumptions have been made in this study about the *general* administrative control of the healing arts. There are, of course, many forms which this administrative framework could take; but suggestions regarding the optimal alignment of powers and functions for the whole of the healing arts are beyond the scope of this study.

Attempts have been made, therefore, to see the problem of dentistry as a somewhat isolated problem. It has not been assumed, however, that dentistry

does not or should not have direct and explicit relations with other areas of the healing arts. On the contrary, dentistry is but one part of a complete corpus of regulation; this study attempts to suggest how to coordinate regulatory functions in the dental industry with those in the larger body. A desirable form for the larger body as it applies to dentistry, therefore, has become part of this study necessarily.

It has been assumed, further, that regulatory control throughout the healing arts would be exercised by bodies having areas of jurisdiction similar to the present professional colleges; in fact, one might continue to call them professional colleges. There is nothing necessarily optimal about the use of these colleges as regulatory agencies. If there were no historic precedents, one might have dispensed with them altogether. The fact is, however, that the professional colleges do exist; they have performed valuable functions in the past; and one must expect that they will continue to do so. Therefore, in the criticism and the suggestions for reform, the Royal College of Dental Surgeons has been taken as a fact — something that is and will be an important part of the regulatory framework in the healing arts.

Assumptions have been made also about what constitutes a professional college. It has two aspects. First, the members of the profession have some responsibility in determining who will govern them. This implies that they have some voice in determining what sort of regulation they must live with. It has not been assumed, however, that the profession should have the sole voice in determining regulations. In the past, the professional colleges have determined regulations for themselves, making them unique among regulatory agencies.

The second aspect of the professional college is the area of its regulatory authority. Traditionally, the professional colleges have taken the responsibility for education, licensing and discipline. These three functions are parts of an obvious whole which might properly be labelled "the maintenance of standards". It makes little sense to talk of licensing or disciplining, if one has no control over education. If the college is to set the standard for entrance to the profession, it must also ensure that there are adequate facilities for training prospective entrants until they reach the required standard.

The belief is expressed in this study that the universities, specifically the faculties of dentistry, should be autonomous in setting and changing their curricula. This, of course, poses a problem for the professional colleges' responsibilities in the maintenance of standards. In the following chapters, it is recognized that the university appears to have this independence *de facto*. This independence should be maintained, but at the same time the RCDS should continue to hold some of its historic responsibility for education.

Part of the background against which these chapters have been written is rather uncertain. This uncertainty arises partly over the introduction of government-sponsored medical health plans, which may be extended to cover dental

health. If and when this happens, considerable changes in the regulatory framework may be contemplated. The criticisms and proposals in this part of the study have not arisen from this contingency, although the possibility of dramatic changes in the provision of health services has been considered. The model adopted is very like that of the General Dental Council in Great Britain. The criticisms offered and the reforms suggested should be applicable under many forms of government sponsorship of dental and medical health. The study has attempted to anticipate some of the changes that might be necessary in the administrative framework of the dental industry.

Other uncertain aspects of the framework relate to the provincial Department of Health and the Ontario Council of Health. The Council of Health has been described as the senior advisory body to the Minister of Health. In the natural course of events, it may evolve into an important and potent force in the healing arts. In its advisory capacity, it could assume a quasi-regulatory role, especially in the areas of jurisdiction between the professional colleges and where co-ordination between two colleges is necessary. Presumably also, it will be influential in the vital area of manpower supply. Although the Council of Health could have an extremely important role in the regulation and administration of the healing arts, this study examines only cursorily what this future role may be.

In attempting to construct an optimum administrative framework for dentistry within self-imposed restrictions, some comment upon the wider issues of regulation and administration has been necessary. This comment is tantamount to an assumption and should be stated here. It has been assumed throughout that it is in the public interest and compatible with our parliamentary institutions that ultimate responsibility for the conduct of the dental profession must lie with the government. If it is not satisfied with the administration of the regulatory bodies — the professional colleges — it has the power and responsibility to change the statutes under which they exercise their power. Furthermore, as the professional colleges are to be regarded in this study as regulatory agencies, they, like other regulatory bodies, should be accountable directly to parliament — to the Ontario Legislature.

In an administrative framework with very direct lines of responsibility from the professional college to the Legislature, any expanded role for the Council of Health is likely to impinge on the roles of the professional colleges. This is disturbing because it is apt to obscure where responsibility actually lies. This may be true also as between the Council of Health and the Department of Health. Dentistry is considered here in relative isolation, therefore, in an attempt to construct a framework which clearly places the responsibility for regulation on the professional college.

Once this responsibility has been placed on the RCDS, changes must be made to see that this responsibility is satisfactorily discharged in the public interest.

None of the assumptions on which the following chapters are based is essential. One could devise an administrative framework in which the responsibilities for education, licensing and discipline were not lodged in the same hands. Similarly, one could imagine a satisfactory system in which all regulatory responsibilities in the healing arts were held by some super body, an amalgamation of the powers and responsibilities of all the professional colleges. This part of the study does not attempt to judge these wider issues; but, to make the task of the following chapters possible, assumptions have been made that recognize the present historic framework and the scope for change within that framework.

Chapter 8 The Role of the Royal College of Dental Surgeons

Formation and Early History

The history of the Royal College of Dental Surgeons has an important influence on the functions which the College performs and on the manner in which they are performed. For this reason some familiarity with the historic antecedents of the present College are salient to the understanding of contemporary issues.

By Canadian standards the history of the College is a long one, but it is still unwritten and records are scanty. In 1866 there were approximately 175 dentists in Ontario; they had no formal organization; many were immigrants; and many more came into the profession by serving an indentureship or apprenticeship, usually of three to twelve months.[1] The profession was unregulated, and it is to the credit of these early practitioners that they recognized the need for regulatory legislation before the Ontario Legislature did.

Meetings were held in 1867 and 1868 for the explicit purpose of creating an association. From these meetings emerged the Ontario Dental Association. The Association sought statutory incorporation of the profession, and speedily accomplished its objective with the enactment of the Ontario Dental Law in March 1868. This remarkable piece of legislation was without precedent and, in its amended forms, can claim to be the oldest continuous dental act in the world. Under it was incorporated the Royal College of Dental Surgeons which, unlike the Association, was not a voluntary organization. Membership in the College was mandatory for anyone who sought to practise dentistry in Ontario. This requirement provided the College with the authority it required to exercise its principal legislative responsibilities — the training, licensing and disciplining of dentists.

It is not possible, and probably not very useful for present purposes, to divine the intention of the Association when it decided to create the College. The important fact is that by 1868 the profession had created two bodies: the Association, in which membership was voluntary and whose purpose, at least in the long run, was perhaps rather vague; and the College, to which all practising dentists were required to belong and which, under statutory provisions, had explicit functions to perform and the means to perform them.

In many jurisdictions dentists do not have both a voluntary organization and a compulsory one with statutory powers. The logic of a dual set of organizations

[1]D. W. Gullet, *op. cit.*

is that it can separate the profession's social responsibility to the public from the vehicle which serves and protects the interests of the dentists themselves. Whether this was intended is a secret of history; what is important, however, is that the College could have limited its concern to the highly important functions of training, licensing and disciplining — in short, to safeguarding the public interest in clinical dentistry. The Association, on the other hand, could have concerned itself with safeguarding the interests of the profession. Under such an arrangement, the interests of both the profession and the public would have been protected; each would have had its policeman and spokesman. This is not how the organizations evolved, however.

The training, licensing and disciplinary functions of the newly created College presumably were felt to be issues in which dentists were best versed. This is a reasonable assumption, and as a result the Board of Directors of the College, in whom the legislative authority is vested, is comprised of dentists elected bi-annually by the members of the College in each of eight electoral districts. Again, this seems reasonable enough.

The election of the Board of Directors by the members of the College — all legally practising dentists — from among their own midst suggests, however, that each Board member is somehow a representative of his electoral district and therefore should reflect the views of his "constituents", speaking on their behalf and for their interests. Thus, the election of the Board should signify either that the Board members represent the views of the members of the profession, or that they act in the interest of the members of the profession, although they may not share the views of their constituents. This seems to be the case, in fact, for the College has expanded its function well beyond its three legislative responsibilities.[2]

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[2]Perhaps one of the best indications of the expansion of the activities of the RCDS beyond its statutory duties is to be found in a report prepared for the RCDS and the Ontario Dental Association. The report, prepared by Woods, Gordon and Co., recommended that:

> The RCDS should concern itself solely with activities related to the protection of the public . . . [and] should voluntarily relinquish all authority and interest in connection with:
> a) The C.D.A.
> b) The Ontario Dental Welfare Plan.
> c) All matters concerning insurance, pension, superannuation or investment plans, either for the dentist and his staff or for the patient or potential patient.
> d) Briefs, purporting to represent the opinion of the Profession prepared for Government Committees or Commissions investigating any subject other than the education, licensing, specialty certification, regulations, discipline or prosecution of dentist and auxiliary personnel.
> e) Fee Schedules.
> f) Public Relations on behalf of the Profession.

At times the activities of the RCDS extended into all these areas, none of which was contemplated in the design of the function of the College. See "A Review of the Organizational Structure of Dentistry in Ontario. A Report Submitted by Woods, Gordon and Co., Management Consultants", *The Journal of the Ontario Dental Association,* Vol. XLI, April 1964, pp. 9-20.

The possibility that the dual existence of the College and the Association would permit the safeguarding of the public interests separate from those of the profession is greatly impaired by the election of the Board by the profession. Both the College and the Association must assume that they are responsible to the profession. Of course, both could feel responsible to the public also; but there is little to motivate them beyond either the statutory provisions, which at best are weak and may not be heeded, or the consciences of individual dentists in influential positions.

Whatever the original purpose of creating two bodies ostensibly concerned with the well-being of the profession, the intention probably was perverted by subsequent history. Because the RCDS required compulsory membership, had dependable sources of revenue, and believed that it had some responsibility towards the profession, it rapidly eclipsed the Association. The latter's only notable activity was the staging of an annual convention. The College became the effective voice of the profession, and if we are prepared to assume that no body can act effectively as spokesman for both the public and the profession, then the public has been without a spokesman.

It should be stated emphatically that the absence of an effective watchdog for the public does not mean that the profession, the College or the Association has abused the public interest. Although this arrangement may seem odd, its only significant effect has been to make the Association a weak and rather purposeless organization.

The College had responsibilities which it could not escape. There was a pressing need to introduce some uniformity in dental training. An attempt to establish a school in 1869 with two students collapsed for financial reasons. This early misadventure, however, set an important precedent. Arrangements were made with the medical school of Victoria College for the instruction of dental students. After the collapse of the school, attempts were made to interest the provincial universities in assuming the responsibility for the operation of a dental school. None was interested.

In 1875, a second attempt to launch an independent school met with success. From its inception, the school was operated under the general direction of the Directors of the College, but apart from a small annual grant, the school was financially independent. By 1888 it had affiliated with the University of Toronto, which conferred the degree of Doctor of Dental Surgery on its graduates. An impressive ninety students attended the school by 1893, but equally impressive were the costs of operation. Greatly increased support was needed from the College, and in that year the "school became an integral part" of the College.[3] Between 1888 and 1906 the examinations for the degree of Doctor of Dental Surgery and the Licentiate of Dental Surgery were held separately. In 1906 these were replaced by a single examination conducted jointly by the university and

[3]D. W. Gullet, *op. cit.*

the RCDS. During the period 1906 to 1925, the influence of the College began to wane, and in 1925 under a special agreement with the university the school was organized as the Faculty of Dentistry of the University of Toronto. The College had now withdrawn as an active force in the training of dentists.

The example set by Ontario has been followed in all other provinces. It may be said, therefore, that the present training programs in Canada have evolved from the professionally operated schools. This contrasts vividly with Great Britain where the dental schools evolved from the dental hospitals or clinics which were originally treatment centres for the poor.

By the 1925 Agreement the College surrendered to the university what was perhaps its principal activity. It maintained a vigilance or surveillance over the Faculty, of course, but this was essentially a passive role. Graduates from the Faculty of Dentistry for all purposes were licensed automatically. The significance of the College in terms of the conduct of the profession and its social responsibility was greatly reduced. It retained its disciplinary and licensing functions, but the latter was of importance only if the candidate for licence had been trained outside Ontario.

At this point, there were three institutions engaged in what might be described broadly as the conduct of dentistry within the province — the Association, the College, and the Faculty of Dentistry — and under this institutional structure there was an overlapping of power, responsibility and purpose. In spite of its dishevelled appearance, however, the operation of the profession was highly satisfactory.

Current Statutory Position of the College

In their broad outlines the statutory responsibilities of the RCDS are the same today as they were when the College was first founded. It is remarkable that the statutory position of the College has remained basically unaltered in view of the considerable changes in circumstances and practices which have surrounded the carrying out of its functions. The relevant pieces of legislation are the Dentistry Act and an Act to Amend the Dentistry Act. Together they confer upon the College all its special powers and, by implication, its responsibilities. It is a peculiarity of the Acts that, while the powers of the College are well defined, there is no corresponding statement of how these powers should be exercised or, more specifically, in whose interest they have been granted.

Much of the problem involved in discussing the statutory position of the College arises because of the ambiguous position that the statutory professional colleges generally occupy. The position of the professional colleges should be more definitely established in the next few years so that they, the professions they represent, and the government know what to expect of each other. In the past the government and the public have been content to permit the colleges to run their own affairs without intervention. It is desirable that the colleges continue to

remain fairly independent of outside pressures of intervention. It is equally important, however, that all parties interested in the conduct of a profession understand what the functions of the professional colleges are and that the colleges see their own functions clearly and have adequate means for performing them.

The position of the RCDS will be discussed in terms of its powers, its responsibilities, and the adequacy of the legislative provisions under which it exercises its powers and carries out its responsibilities. This, of course, makes it mandatory that the composition of the College be considered and that one examine how the powers of the College actually are exercised.

Powers of the College

The historic powers granted the RCDS in the original Act remain intact under the present legislation. These fall conveniently and deliberately into four areas:

1) *Licensing powers.* The College is incorporated as the sole licensing body in the province. It issues a Licentiate of Dental Surgery upon the successful completion of examinations which it prescribes and the payment of an annual licensing fee. Upon the payment of the fee, the holder of the Licentiate becomes a member of the College. Without registration in the College it is illegal to practise dentistry in Ontario. It is left to the College to determine who may qualify for registration, but the annual fee must be approved by the Lieutenant Governor in Council. The Lieutenant Governor in Council has never failed to approve the fee recommended by the College.

2) *Educational powers.* The College is vested with the power to examine any prospective dental student and to prescribe a curriculum of studies which the student must complete before he is permitted to sit for the examinations that qualify him for registration to the College.

   The College has the right to delegate these powers to some other agency. In fact, these powers are now held almost in abeyance and have been delegated to the accredited faculties of dentistry. Perhaps the most important use of them arises in the assessment of the qualifications of dental students trained elsewhere than in the accredited dental schools in Ontario.

3) *Disciplinary powers.* The Dentistry Act stipulates what constitutes the illegal practice of dentistry and provides for penalties under the Summary Convictions Act. It also provides a mechanism and grants the powers by which the College may take action against its own members for "infamous, disgraceful or improper conduct in a professional respect". A recent amendment to the Act has directed that this phrase shall include "professional incompetence, gross carelessness in diagnosis and fraudulent or exorbitant charging of fees". If

a member is found guilty under the provision of the Act, the College may cancel or suspend his licence or levy a fine.

Quite separate and distinct grounds, which do not relate directly to professional conduct as it may be generally understood, are provided for the suspension or cancellation of a member's licence. The College may cancel or suspend the licence of a member who is convicted of an indictable offence. The College may even take action against a member because of an alleged criminal offence, even if the member has been acquitted of the offence in a court of law.

4) *The power to enact by-laws.* The Board of the College may enact by-laws for "the proper and better guidance, government, discipline and regulation of the Board, the College, the members of the College and the profession of dental surgery, and the carrying out of this Act". Before becoming effective, the by-laws must be published for two consecutive weeks in the Ontario Gazette and may be annulled by the Lieutenant Governor in Council. It appears that the Lieutenant Governor in Council has never exercised his prerogative.

By-laws setting the annual registration fee or relating to dental hygienists must receive the approval of the Lieutenant Governor in Council, and although this approval has always been forthcoming, there have been delays in bringing such by-laws into effect.

Broadly, these are the effective powers granted to the College. They are obviously sufficient to make the College a potent force in the moulding of the profession and the dental industry in general. The first two powers have been delegated to the accredited dental schools within the universities. These powers have not been abdicated, nor are they ineffectual; there are some very compelling reasons why the College should permit the universities to exercise these delegated powers.[4]

With no direct involvement in education, then, the main powers of the College appear to be its judicial and legislative powers — that is, its ability to discipline members of the profession and to make by-laws. Since the by-laws constitute part of the legal framework of the College, they may be regarded as part of the statutory background.

The By-Laws

The present by-laws merely clarify and largely reinforce provisions of the Dentistry Act. The College has not used its power to make by-laws to extend its authority into areas which are not explicity covered by the Act.

Six of the by-laws (1, 2, 3, 13, 14 and 15) deal with the election, conduct, duties and remuneration of officers of the College. If to these is added by-law 16,

[4]The most compelling reason of all is, of course, the relative financial strength of the universities.

which simply states that any of the by-laws may be repealed or amended, seven of the existing sixteen by-laws are concerned with the internal government of the College. These are unexceptional and are clearly intended to complement the Act.

A further six (5, 6, 7, 9, 10 and 11) are concerned with licensing or registration procedures. Collectively, this important group of by-laws determines the conditions under which one may qualify for admission to the College. Through these by-laws the College formally determines the standard of competence that must be attained before one may be permitted to practise in the province.

By-laws 8 and 12 fall into neither of these categories. Number 8 is concerned with internships. The remaining by-law, 12, "For the Regulation of the Profession of Dentistry", establishes the proper scope of the dentist's professional activity and how a practice is to be conducted.

Educational Responsibility

The Board has assumed responsibility for the education of dental students, partly for historical reasons and partly as an extension of its licensing function. At the time of its incorporation there was no institution in Ontario that undertook to provide high quality professional training in dentistry. Part of the intention of the infant College apparently was to fill this gap. Only after it became possible for prospective students in dentistry to receive an adequate education could the licensing procedure become significant and operational.

As recounted in the capsule history of the College, however, the actual training and education of dental students has now passed to the universities. When the Board was actively engaged in the conduct of the School of Dentistry prior to 1925, its responsibility for and power over the education of dental students were meaningful. Although the College deliberately delegated the initial responsibility for training to the dental faculties, in doing so it may well have lost most of its power to influence the education of dental students.[5] Now that dental students are being educated exclusively in university faculties, this power has lapsed into disuse.

Relations Between the College and the Faculties of Dentistry

In theory, the Board has merely delegated its responsibility for education to the university faculties, and, in theory, the faculties are thought in some sense to be accountable to the Board for the education they provide. In the past, the College and the Faculty of Dentistry of the University of Toronto have been in close contact. The College appears to have been content to exercise its responsibility over

[5]The overwhelming opinion in casual interviews was that the College could not "direct" the education of dental students if a disagreement arose between the universities and the RCDS. This is speculative, however, since the relationship of the RCDS and the dental faculties has been harmonious.

dental education by a process of consultation with the faculty. Whether this harmonious process of consultation has succeeded in the past is difficult to determine; it may be wondered how familiar many members of past boards have been with the details of the curriculum, problems of staffing, and so forth. (The College seems to have remained conscious of its responsibility, however, for it played an important part in the establishment of the Faculty of Dentistry of the University of Western Ontario.[6]) The problem, however, is not whether this process, which may have been largely informal, has worked in the past, but whether it will work in the future.

The traditional framework has come to an end. With the establishment of a faculty at the University of Western Ontario and the possibility of others to be established elsewhere, the Board will no longer have only one curriculum to watch, nor will the pleasant and often effective method of casual consultation be as dependable. Simply because of geographic separation, the Board will probably now have to depend upon a more formalized procedure. This will increase the possibility of open conflict between the Board and the faculties.[7]

Refusal to Grant a Licence

If the Board became involved in a conflict with one or more of the faculties, it is difficult to see just what powers it could exercise to control the situation. It certainly could not "order" a faculty to make changes in its staff or curriculum. The universities have a tradition of resisting outside pressure, at least where academic matters are concerned; the faculties of dentistry probably would be just as zealous in safeguarding this right as any other faculty. Moreover, under the present legislation the Board has no powers by which it could "order" a faculty to do anything which the faculty chose to resist. In any imaginable conflict, therefore, it seems likely that the faculty could successfully pursue any course it chose. Parenthetically, it may be added that the traditional independence of the faculties should be preserved. The reasons for this will emerge later.

If the faculties are, in fact, independent of the Board and the Board is dissatisfied with the education that dental students receive, it may do one of three things. First, it could refuse to accept the dental degree as a sufficient condition for registration as a member of the College; second, it could require candidates to sit examinations set by the College; third, it could refuse to consider graduates for admission to the College until the students had fulfilled whatever conditions the

[6]This is the opinion of the Board of the RCDS and of officers of the Board. Whether the RCDS has real influence in this direction probably depends upon the respective Ministers of Health and Education.

[7]The situation in Ontario is now analagous to the current situation in Great Britain where there are several "Dental Authorities" which provide dental education but which are responsible to the General Dental Council. It was learned in interviews that the General Dental Council has had to adopt stern measures to bring some authorities "into line". The GDC attempts to maintain much closer scrutiny of the Dental Authorities than the RCDS does of the dental faculties.

Board deemed necessary. Any of these actions would, of course, bring considerable pressure to bear on a recalcitrant faculty. They are potent weapons; but they are offset by two important considerations: first, should a faculty be subject either to the threat that such powers might be employed or to their actual use; and second, in practice, would the Board ever be able to employ these threats. The first consideration hinges on the desirability of the independence of the faculty and will be left until we consider this question explicitly. The idea that the Board may not be able to contemplate using these powers hinges on rather different considerations.

If the College refused to license the graduates of a particular faculty or made membership in the College more difficult to obtain for the students of a particular faculty, understandably there would be a great public outcry. The public probably would not tolerate a situation in which students trained in an accredited Ontario university were refused admission to a profession. In the case of the RCDS this pressure is apt to be severe because of the widespread belief that there is a chronic shortage of dentists. Much of the pressure and much of the outcry would be directed towards the College itself. Knowledge of these factors would cause the College to hesitate in exercising these powers, regardless of how justified they might be in the public interest.

It is difficult to imagine a situation in which the provincial government would tolerate the opposition of the RCDS to a university. If open conflict developed, the interests of the RCDS, the faculty, the public and the government all would be at stake. It seems likely, therefore, that the provincial government would feel bound to intervene. A situation which became so controversial that it provoked government intervention conceivably could threaten the existence of the College itself. Use of the power to bar the graduate of a particular faculty from admission to the College, therefore, is unlikely, except in extreme circumstances. For the great range of problems that is likely to face the College, refusal to grant a licence is a useless weapon or tool. The value of this power lies not in its actual use, but in the threat that it could be used. Even under the present legislation, however, the College has rather more subtle means of leading the university faculties in a direction they might not otherwise choose to go.

The idea that the College should be privileged to intervene directly in the affairs of the faculty has been dismissed. The College, however, should not abandon all but its consulting role in the internal affairs of a faculty. A system is required by which the College can have an effective voice within the faculty, but which still permits the faculty all its traditional freedom. There must, of course, be some inducement for the faculty to listen to the College; the College's opinion must have some special significance.

Financial Inducement

The way to attach significance to the voice of the College without actually permitting it to intervene in the affairs of the university is relatively simple — the College could become directly engaged in the administration of reasonably large

funds which are destined for the university. There are several advantages to the College's becoming involved in the financing of the dental faculties; there are also some drawbacks.

The danger in such a scheme is that the faculty may become dependent on the funds supplied by the RCDS, regarding it as the obligation of the RCDS to provide them. This attitude would completely defeat the purpose of the scheme. A preferable arrangement would be to make the funds available to the faculty at the discretion of the RCDS. The faculty, then, could not become dependent and the university would have to continue to play its customary role in financing the faculty.

The "extraordinary" funds at the disposal of the RCDS could then be used to bring a recalcitrant faculty into meaningful negotiations. Under normal circumstances these funds might be earmarked for research purposes. Most Deans are well schooled in the fine art of negotiation for research money and are accustomed to the idea that such funds are intended for particular types of research. Over a period of time the type of research which the school engages in helps to determine the composition of the faculty, and ultimately the curriculum and the students attracted to the school.

Of course, there is no particular reason why funds at the disposal of the RCDS should be directed to specific research projects. They could be made available for other purposes. Research does have some special advantages, however, the principal one being that universities are accustomed to receiving research funds which have strings attached. Because the university is always in a position to accept or reject funds, it does not regard these conditions as a threat to its traditional autonomy.

This proposal has other important advantages. It would increase the generally meagre funds available for dental research and help to answer the widespread feeling that more funds are needed. It also could alleviate the expressed fear that the quality of the dental faculty will deteriorate, if it has not already done so, vis-à-vis the United States, because of the lack of research opportunities in Ontario.[8]

The administration of a fund destined for research might have a salutary effect on the RCDS also. In considering how such money should be allocated, the RCDS would have to become fully conversant with the actual operation of each of the dental schools. As already intimated, there is no mechanism by which the College can or does remain very knowledgeable about the operation of the dental schools.[9] Equally important, the Board members of the College would have to

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[8]For example, see K. J. Paynter, *Dental Education in Canada,* Royal Commission on Health Services, Queen's Printer, Ottawa, 1965, pp. 61-72.

[9]Each dental faculty has one member on the Board of the RCDS and the RCDS has representation within the faculty of the University of Toronto. It must be questioned, however, how fully acquainted *each* member of the Board is with the internal operation of the dental faculty.

keep informed of the general advance of dentistry in other jurisdictions. This would apply to research, to the operation of dental schools and to training in dentistry.

It must be remembered that the Board presently is composed of dentists engaged in private practice. Although they are likely to be well meaning, intelligent men, the pressures of private practice leave little time or inclination for keeping abreast of the most recent advances in the whole field of dentistry. Further, a member of the Board has little inducement to become familiar with the wider aspects of dental education and research. If the Board does not keep itself informed, however, it may lose its competence to judge the adequacy of new entrants into the College. In time these new entrants, whether or not they originally were adequately prepared to enter the profession, become the pool from which future Board members are drawn. In the absence of some other standard, members of the Board will consciously or unconsciously use the training they received to determine the standard which new entrants must attain. If the members of the Board are not constantly forced to review the advances in dentistry, dental education and dental research, relative standards could fall, especially if the burden for determining them were placed solely in the hands of the Board. Of course, this burden is carried largely by the faculties of dentistry.

If the Board became responsible for the administration of research funds, there would be a direct inducement for Board members to remain or become familiar with general developments. As a desirable side effect, the Board would be more capable of judging the adequacy of new entrants to the profession. Ultimately, the Board would be in a better position to judge the adequacy of the dental faculties in performing the responsibilities which the Board deems necessary. Under these circumstances, the significance of the powers and responsibilities which the Board has in dental education would take on new meaning.

Thus far, two methods by which the Board could influence the dental faculties have been considered — the use of its licensing powers, and the use of research or other funds to be made available to the dental faculties. It seems clear that the first is a crude method producing very undesirable results, and that it could be resorted to only in the most exceptional cases. The second will fail in many circumstances because it is overly subtle and will have its most telling effects only in the long run.

Educational Involvement

The present legislation does allow another possibility. Its chief disadvantage is that no one seems to have recognized it. It would be viewed as a change in the rules of the game and for this reason would encounter considerable opposition on emotional grounds alone. Still, it is a possibility which must receive serious consideration.

The most effective means for the College to mould the education of dental students is to once again become directly involved in the educational process.

There are two ways by which it could do this. First — and this probably does not merit serious consideration — the College could establish a program to parallel the degree course offered by the dental faculties. Such a program might demonstrate what the College expected of the faculties by setting an example. But the College probably would be unsuccessful in attracting suitable faculty members, simply because it could not offer the wider advantages of a university atmosphere. Similarly, students in such a school would probably suffer from their isolation. These two considerations are serious strikes against such a proposal and are perhaps sufficient to dismiss it.

The second possibility, and this has many attractive aspects, is that the College could assume responsibility for some phase of the student's training. This plan has a number of advantageous factors from the point of view of the College, the faculties (and the universities) and the students.

Whenever students and staff of the faculties of dentistry begin reflecting on their role within the university, they almost invariably become uneasy or apologetic about the amount of time that is spent in learning digital skills.[10] The misgivings seem to arise from a feeling that such skills — obviously vital for the practice of dentistry — lack scholarly virtue. Whether such feelings are justified is not our present concern; the important thing is that they exist. Their existence may lead to less emphasis on these skills than the "public interest" might require, although this does not appear to have happened in the past.

On the other hand, while students perhaps are apologetic about the time that must be spent learning these digital skills, they appear to be uneasy about setting up practice immediately upon graduation.[11] Increasing numbers of them are seeking associateships so that they may gain experience by working with an established dentist.

For both these reasons and because of the simple pressure of time within the curriculum, there has been considerable talk about instituting some sort of internship or externship.[12] Clearly, whatever form such a proposal may take, its principal purpose is to enhance the clinical skill of the student before he is permitted to establish a private practice.

Before unravelling the proposal, there is a further defect of the present system which merits attention. Faced with a clear refusal on the part of a dental

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[10]"Dental education has been criticized by educators both within and outside the dental profession because of the high proportion of time devoted by students to the acquisition of digital and technical skill." K. J. Paynter, *op. cit.*, p. 55. From discussions with faculty and young dentists it appears that many of them share the misgivings of the "educators".

[11]To the author's knowledge, documentation of this trend is not available. The growing strength of the trend was suggested in interviews with members of the Faculty of Dentistry, University of Toronto.

[12]Nothing significant appears to have happened concerning institution of a dental internship since 1958 when the Canadian Dental Association issued a pamphlet *Hospital Dental Services and Dental Internship.*

faculty to make stipulated curriculum changes, the College could institute its own examinations for the licentiate of the College. As part of the preparation for these examinations, the College could indicate clearly that the students are to become familiar with particular subject matter omitted from the dental school curriculum. Provided the omitted material is not extensive, and that it can be absorbed readily by the typical student, this would be a satisfactory method of repairing any undesirable omissions in the dental school curriculum. The typical student, however, would not be able to acquire familiarity with the omitted subject matter if it could be learned only in a clinic. Thus, the use of the licentiate examinations to compensate for curriculum omissions is feasible only when the omitted material can be gleaned from a textbook; it will not work satisfactorily when the omitted material should properly be learned in a clinic, for the student does not have access to a clinic. To give the student clinical experience, the College probably would have to operate teaching clinics or contract to have them operated on its behalf.

These three important problems have a common solution. Dental faculties express uneasiness about the amount of time that must be spent on the acquisition of digital skill and clinical routines; dental students appear to be seeking wider clinical experience before entering solo practice; and the effectiveness of the licentiate examinations in determining the quality of new entrants into the profession is diminished because of the lack of teaching clinics outside the universities. These considerations, coupled with the serious proposal that the dental curriculum be extended another year,[13] suggest that the time may be ripe for the RCDS to consider the establishment of a teaching clinic or clinics.

The existence of such clinics would permit the universities to place more emphasis on subject matter which they believe to be more properly suited to a university curriculum. If properly established, they would meet the need of the dental student for wider clinical experience. But most important of all, they would provide the RCDS with the means to exercise its powers and responsibilities with regard to the education of dental students.

Involvement with clinics would lead to a greater awareness by the Board of the difficulties of providing adequate dental education. Not only would the Board become a better judge of the standards which should be met by new entrants to the profession, it would also be more appreciative of the problems confronting the universities, and more sympathetic to their search for solutions to mutual problems.

The purpose of the clinics would be to prepare the student for the licentiate examinations and ultimately for private practice. The clinics could be used at the discretion of the Board to teach whatever material it considered should have been

[13]It does not appear that any authority is actively considering the question of extending the length of dental students' training. Unofficially, however, the issue has been a subject of discussion. For example, see the Committee on the Healing Arts, *Proceedings,* April 3, 1967, p. 2013.

included in the faculty curriculum but may have been omitted. By using the clinics to "round out" the students' education, the Board would avoid the risk of open conflict with the faculty or the public. With all students receiving a common clinical training and writing a common licentiate, the Board and the universities would obtain valuable insights into the relative merits of different faculties and curricula. This would be achieved without embarrassment and without resort to the rather subjective evaluation of the visiting inspector who is employed in other countries.[14] Ultimately, such a plan should relieve the RCDS of ever having to discriminate against graduates of a particular faculty because of curriculum deficiencies or inadequate teaching.

Although the advantages of such a proposal are considerable, we must not overlook some important offsetting disadvantages. They will be considered in a detailed discussion of the mechanics of this proposal in Chapter 10. At this point we shall remark only that the RCDS presently lacks the financial resources both to run a clinic and to provide research funds; it originally delegated its educational responsibility because of financial pressures.

Conclusion

The powers and responsibilities in education which the RCDS appears to have been given in the existing legislation, while perhaps not ineffectual, are certainly not adequate for the College to live up to the intent or expectation of that legislation. The reason for its weak position is the inadequacy of its present financial resources; it cannot afford to carry out the policy and programs through which it could fulfil its responsibilities.

The Licensing Function

Just as we had to speculate on the purpose of involving the RCDS in the formal education of dentists, we must try to decide why it became involved in the licensing of dentists. On the question of education we dodged the issue by arguing that it was a precondition of effectively carrying out the licensing function. The question now is, "What is the purpose of the licensing function?"

In most of the western world, persons administering to the sick hold some sort of licence that purports to attest to their qualifications. Because the practice of licensing is widespread and because it has persisted for several generations, it is seldom called into question. It seems characteristic of man that when his reasons for doing something are vague and ill thought out, he resolves the question of justification by taking it for granted. Such is the case with much professional licensing.

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[14]The General Dental Council in Great Britain has a system of "visiting inspectors". The inspector is responsible for determining in the first instance whether or not a particular Dental Authority meets the standards of education set by the General Dental Council.

Methods of Regulation

Regulation of a profession or trade can take one of three forms: registration, certification and licensing. Each represents progressively more control over the group being supervised. Registration in its simplest and purest form requires that persons engaging in an activity place their names on a register. No special skills must be demonstrated and no special conditions fulfilled. Normally anyone who wishes to register may do so. Since there are no preconditions attached to registration, the maintaining of a register cannot be used to control the activity. The purpose of registration must then lie somewhere else. Its first purpose is often to permit a form of specialized taxation. This is often justified because the activity imposes special costs on the community at large which should be borne in part by those persons responsible for the activity. Registration may be desirable also for simple reasons, such as the collection of social statistics, as an aid in law enforcement, or as a convenient way of permitting those who seek a service to find it through reference to a register. Normally, where registration is required under government legislation, it is mandatory for all those engaged in the activity.

The maintenance of a register, unless the registration fee is burdensome, does not impinge on the right of anyone to engage in an activiity, nor would it normally hinder a person from entering into a contract with anyone he chose for the provision of that service.

Certification procedures maintain a similar degree of freedom. Under a certification scheme, anyone who wishes to engage in a particular activity may do so. Only those who have attained a particular level of competence, however, and have successfully met the preconditions for certification are granted a certificate. Thus, certification does provide some degree of control over the activity. The existence of a certification procedure and the fact that some practitioners are certified and some are not will often be sufficient to suggest that those without certification are less qualified to perform the activity than those who have been certified. Certification carries with it something of an assurance about the qualities of the practitioner. This will have important ramifications.

Since the certified have a testament to their ability, those seeking the service turn first to those who are certified. Thus, there is a compelling reason for all those capable of being certified to seek certification. Those unable to meet the conditions for certification usually will be able to compete only if they offer to perform the same service at a lower cost. A certification procedure may be expected to lead to a price differential between the certified and the uncertified. This price spread would diminish if a shortage of personnel existed and would increase under conditions of excess personnel.

Whether or not the certification procedures actually raise the standard or quality of the service provided depends upon two things. First, obviously, it depends upon what preconditions have to be met in order to attain certification; and second, it depends upon the nature of the service provided, and the supply

of and demand for it. It generally is assumed that while certification may not raise standards, it certainly does not lower them. Is this assumption justified?

As already suggested, certification carries with it the implicit assurance that certain quality standards will be met. If the service is such that the receipient cannot judge its quality, it may be possible for those with certification to remain fully employed, even though the quality of the service they provide is below that of the non-certified. In the technical jargon of the economists, the certified service is differentiated simply because it is certified. Certification imparts an element of monopoly. This becomes more significant the more buoyant the demand for the service becomes. The certified may be able to raise their prices and lower the quality of their services because of increased demand. The certification procedure insulates them from the competitive pressures of the non-certified.

If, however, the recipient of the service can readily discern the quality of the service he receives, the certification procedure has less power to isolate the certified from the uncertified. Under these conditions, both the price differential and the possibility of a quality gap are much diminished. If current demands for the service can be met or largely met by the certified practitioners alone, then the certification procedure could be expected to raise the quality of the service provided. Unfortunately, one cannot state this definitely. The effects of certification on quality will always be somewhat uncertain.

Licensing is more akin to certification than it is to registration, in that it requires that certain preconditions be met. It goes much further, however, for only those who have met the preconditions are entitled legally to engage in the activity. Thus, the person seeking the service cannot enter into a contract with anyone he chooses. He is restricted to those who are licensed to perform the activity.

The Purposes of Licensing

Restricting Entry to the Profession

The purpose of the licensing procedure is to "restrict" those entitled to perform the activity. If this is not the case, the licensing procedure has no meaning. Curiously, some of the most ardent advocates of the licensing of physicians and dentists claim that licensing does not restrict entry into these professions.

The only grounds on which licensing can be justified is simply that it confers some net advantage on society as a whole and on some individuals in particular. There are some obvious disadvantages or social costs entailed in a licensing procedure; for example, it violates the freedom of the individual to enter into a contract with anyone he wishes for the performance of a service. Licensing, then, places the licensed in a quasi-monopoly position. The justification for this must be clearly spelled out if we are to understand what we hope to gain by licensing dentists. With this in mind, we can determine how successfully the present legislation operates. For the moment it must be accepted that licensing does

restrict the number of persons providing the service but, for the moment, the extent of this restriction will be ignored.

Protecting the Patient from Ignorance

Restriction of entry into a profession must be designed to protect one or both of two groups: those who provide the service, and/or those who receive it. Licensing in the healing arts is assumed generally to protect the patient. If this is so, the question then is why does the patient need protecting? At this point, it seems best to narrow the matter to the specific case of dentistry.

If the licensing of dentistry is designed to protect the patient, it must be premised on the assumption that the patient is incapable of determining the quality of the dental treatment he receives and — to take the notion a little further — that he is basically ignorant of what constitutes dental health. How fair an assumption is this? A great many professional dentists would readily endorse its validity, and it is difficult to quarrel with their verdict.

There are many factors which suggest that the popular attitude towards dental health is somewhat unsophisticated, that the typical person does not seek sufficient information to make wise decisions when matters of dental health are concerned. This makes him susceptible to fraud, incapable of judging the quality of service he receives, and even unable to determine what sort of services he requires. There is one striking example of public attitude that calls into question the efficacy of popular opinions in matters of dental health. This is the issue of fluoridation. Here, a well-publicized question in dental health has been left to the public to decide, and almost all experts despair of the results.

Since the average person is incapable of judging the quality or quantity of services he requires, licensing may be used to ensure that only those people who *do* know will be allowed to practise. In other words, the patient may be protected from his own ignorance. Unfortunately, this is not a sufficient reason for licensing dentists. Society grants the freedom to be ignorant and most citizens make rather full use of this freedom. We must look for another reason.

Protecting the Patient from Fraud

A peculiar aspect of dentistry is that once many of the services of the dentist are performed, it is difficult to determine whether they were necessary in the first place. This aspect of the professional service is very important, for, as we have demonstrated, the patient himself cannot judge whether he really needs the service. He must be guided by the dentist. If the patient later becomes dissatisfied with the service he received, he lacks the evidence to bring an action against the dentist. Such evidence as he might have had has been forcibly removed, or cleanly drilled and filled up. It is almost impossible for anyone to establish that a tooth should never have been removed, or that there is now a filling where a cavity never existed.

The patient's ignorance makes him an easy victim of fraud; the nature of dental service makes the fraud very difficult to detect even for an expert. In this respect, services rendered by a dentist are basically different from services rendered by many others. In other situations, the ignorance of the recipient may render him susceptible to fraud, but with the aid of an expert, he may be able in retrospect to detect the fraud. The more easily the fraud may be detected, the less the consumer need worry about it. But in dentistry, as in many other areas of the healing arts, fraud is difficult to detect. It is desirable, therefore, to protect the patient from exposure to this possibility.

Fraud in dentistry can be of two types. First is the deliberate premeditated type. The second and, in the absence of licensing, potentially more common and serious is fraud arising from incompetence. This occurs when someone attempts to perform an operation that he simply is incapable of performing, or attempts to diagnose something he simply does not recognize. Fraud due to incompetence often can be detected in retrospect, but it could escape notice altogether. A simple example of the latter would be the extraction of a tooth that need not have been extracted.

To most people the purpose of licensing would appear to be the prevention of fraud due to incompetence. Indeed, this is a paramount justification for licensing, and it should be distinguished from "pure" fraud.

Distributing the Service

Licensure is sometimes used in another way to benefit the consumer or the patient. Licences are sometimes tied to specific geographic areas to effect a distribution of the service which would not arise spontaneously. Normally, such a procedure makes the service more widely available. Availability may be regarded merely as an aspect of the service.

The reasons for licensure may now be summarized in one notion: licensure is intended to raise the quality of the service.

Before we return to the RCDS to see how the mechanism of licensing at its disposal satisfies these conditions, there is another facet to licensing which deserves scrutiny. This is the effect of licensure on the provider of the service — on the dentist.

The Effects of Licensing

If the effects of licensure on the dentist go beyond the area of quality of the service, these effects will be transmitted ultimately to the patient. From the patient's point of view, these may be thought of as the indirect effects of licensure.

Raising Costs

Again, licensure restricts the number of persons providing the service. Therefore, the number of hours of dental service is less than it would have been in the

absence of licensure. This might be expected to raise the costs of dental services to the patient and to raise dentists' incomes. Historically, this seems to be the case, and it appears to be the case today in Ontario. Certainly, part of the cost of dental services should be viewed as the price paid for the increase in quality which licensure is supposed to induce.

An important effect of the increased costs of dental services, however, is that undoubtedly some persons seek less dental service than they otherwise might. This may be put in blunter terms: the costs of raising the quality of the service is that the service becomes prohibitively expensive for many members of the community. When the quality of the service is raised for some, others may be deprived of it altogether. This is such a distasteful aspect of licensure that many react by denying that it happens at all. Unfortunately, denials cannot change the fact. The population splits into two groups: those who can afford to avail themselves of the full advantages of improved standards, and those who cannot. Licensure, therefore, not only discriminates among practitioners, it also discriminates among patients.

Licensure, if it is to be justified, must be justified on the grounds that the loss of welfare to some is more than compensated for by the increased welfare of others. The presumption must be that there is a net gain to the community as a whole; what must be recognized is that there is a specific loss to some.

The Failure of Current Licensing Procedure

We can now approach the original question: is the statutory control which the RCDS has over the licensing of dentists adequate to fulfil the intentions of the legislation? That is, does it raise the level of dental care available to the community? This question has two separate aspects: first, the quality of the dental care that is actually provided; and second, the effect of the restricted numbers of dental hours. When these aspects have been considered, the average level of dental health in the community may be estimated. Unfortunately, a definitive discussion along these lines is impossible because of the lack of empirical information and because of the conceptual problems involved. There is simply no mechanism by which the "average" level of "welfare" in a community can be discovered. An inability to come to a definitive quantified answer, however, does not mean that we are unable to say anything at all.

The Assumptions

The licensure of dentists is based at least in part on a fallacious assumption — that there exists a strong correlation between performance and capability. There seems to be also a subsidiary assumption that capabilities once attained will be maintained. There seems to be a rather dramatic absence of evidence for these assumptions.

There is no *official* version of the assumptions on which the present licensing procedure is based. They do, however, seem to be the *only* assumptions on which

current practices are based. To gain admission to the profession, a candidate must follow one of three licensing procedures; having completed the requirements for licensure, he is then entitled to practise dentistry as long as he pleases by paying his annual licensing fee. Under normal circumstances the College will never again ask him to demonstrate his technical capabilities. The RCDS makes no systematic attempt to discover whether the licensed dentist provides a service comparable to that demanded of him in the licensing examinations. Because of the general advance in the technical aspects of dentistry, the dentist's knowledge is apt to become obsolete; yet there is no external compulsion for him to keep abreast of developments within his field.[15] The licensing of new entrants is based on the state of the profession at the time that they sit for their licensing examinations. Thus, many new entrants to the profession have technical capabilities beyond that of practising members. This is recognized by the RCDS.[16] The implication is that the existence of at least two standards is tacitly recognized — the standard set for entrance to the profession, and the standard of practice. How far the actual standard of practice falls below the standard set for entrance is not known, but it seems likely that in some cases it falls considerably below that of new entrants. Some definite information on the discrepancy should be sought.

The Quality of Clinical Dentistry

A negative comment on the licensing procedure arises from the foregoing observation. The licensing procedure, as it is presently conducted, gives the RCDS little control over the quality of dentistry practised. In its present form, the licensing procedure does not live up to the expectation of the legislation because the RCDS does not have effective control over the quality of clinical dentistry. This is exemplified by the fact that no one has any concrete idea of the general quality of practice.

The use of the present licensing procedure is not an adequate means of ensuring that practising dentists attain the quality level deemed desirable by the RCDS. Under the existing legislation the RCDS has the power to take more direct means to maintain high levels of competence and practice. But it has chosen to rely solely on the licensing procedure, apparently because of a reluctance to meddle in the affairs of the practising dentist. The prevailing attitude has been that, once qualified, the dentist becomes a professional and that professionals by nature remain conversant with the latest developments in their fields, without the need for inspectors or further examination to keep them on their toes.

This attitude of the RCDS has some merit. Undoubtedly, some individuals do work better when all the responsibility for their actions is placed squarely upon their own shoulders. Any external interference — for example, in the form of inspection or periodic examinations — would be viewed as a form of harassment.

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[15]Committee on the Healing Arts, *Proceedings, op. cit.*, pp. 1906-1915.
[16]*Ibid.*

We cannot support this as the general case, however. The whole principle of licensing rests on the assumption that the profession and the welfare of the public require government intervention to force a standard of practice which would not be met in the absence of licensing. By sanctioning licensing, we remove the grounds for the argument that individuals will perform best if left alone.

This reasoning seems to be behind the College's reluctance to interfere with the practising dentist. The RCDS seems to feel that it does not have the right to interfere — or, to put it the other way around, that the dentist has the right to practise as he pleases.[17] This clearly is alien to the whole basis of the licensing procedure and its justification. Is there, therefore, some aspect of the composition of the RCDS or provisions of the Dentistry Act which have led to the adoption of this attitude? Schools of dentistry teach dentistry, not virtue. It is hard to believe that dentists are either more or less virtuous than most other people; and unless they can establish that they are more virtuous, there is no basis on which we can justify their "right" to be free of intervention concerning the provision of dental services.

The Prevention of Fraud

There is an even more fundamental question: does the licensing procedure prevent outright fraud? The almost total absence of any charge of malpractice or fraudulent behaviour brought against dentists may arouse as many suspicions as it quells.[18] One is reluctant to assume that dentists, even with the aid of the current licensing procedure, are possessed of moral superiority. One may really wonder if their collective record is as clean as it appears, if dentists as a group are innocent of fraud, and if their glowing record can in any way be traced to the current licensing procedure.

As we have seen, the licensing procedure most certainly does have some effect on the competence of practising dentists, and we may assume that it eliminates much fraud due to incompetence. It would seem, however, that by creating a profession whose code of ethics proscribes public criticism of colleagues and which endows its members with a public seal of approval, we have gone a long way towards creating conditions favourable to the more innocent forms of fraud. Offsetting this, however, is the restricted quantity of dental services available. Historically, this has had the effect of ensuring that the dentist is fully employed. The fact that the dentist is confronted with an excessive amount of work that must be done removes one of the prime incentives to fraud. It pays just as well to be

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[17] *Ibid.*, pp. 1909-1912. This attitude on the part of the RCDS appears to be changing somewhat. From discussion with the members of the Board it was clear that some, but not all, were aware of the conflict between the concept of licensing to protect the public and the right of the dentist to practise without being subject to examination or inspection. It is not clear what, if anything, the Board will do in the future; the problem has occupied the attention of several past Boards without any action being taken.

[18] B. Westlake, *A Comparative Study of Discipline in the Healing Arts Professions*, a study prepared for the Committee on the Healing Arts, unpublished.

honest as it does to be dishonest. Just how strongly this factor operates, however, is open to question. Undoubtedly, patients are sometimes given restorations that are rather more expensive than is necessary. Whether in a modern society licensing procedures lead to an increase or a decrease in fraud is impossible to say. We cannot assume that fraud is prevalent in Ontario; nor can we assume that it is not. We have no evidence to support either contention. We can, however, judge the effect of the licensing procedure in this respect.

The very fact that the effect of the licensing procedure on fraud is not apparent leads to the conclusion that, at best, it is an indirect way of controlling fraud. If the intention of the licensing procedure is, in fact, to eliminate some of the possibilities of fraud, then licensing must be reinforced with other measures. To a limited extent these "other measures" exist in the form of disciplining procedures and will be discussed in that section. The essential point to be made here is that the licensing procedure itself does not in any direct way eliminate, reduce or prevent fraud, nor does it increase the likelihood that the fraudulent act will be detected.

So far, the verdict on the licensing procedure reads: probably has a favourable effect on the quality of service actually provided, but the quality of service is probably lower than the capabilities demonstrated at the time of entrance to the profession. Therefore, the possibility of fraud due to incompetence is reduced. There is no reason to believe that it has any effect one way or another on deliberate fraud.

Availability of Service

Now we come to the most delicate aspect of licensing — recognition of the fact that, as dentistry is presently constituted, licensing leads to a reduction in the total amount of service available. The argument here is highly speculative, because no one knows what would happen if licensing were abandoned. First, it should be noted that even if licensing were abandoned, high quality dentistry would still be available. The wealthy presumably would be just as eager to avail themselves of the best as they are now, and it would therefore be worthwhile for some dentists to take university training. It is what would happen at the other end of the scale that is of concern.[19] Undoubtedly, treatment at this end would be rather crude. While crude treatment is often better than no treatment at all, it may sometimes be positively harmful. Those practitioners who are positively harmful, however, would develop a corresponding reputation, and this alone might curb their activity. Much as the existence of unlicensed practitioners may be deplored, it seems likely that their absence does impose a real burden upon segments of the community.

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[19]It is interesting to note an attempt to circumvent the law as it now stands. The recourse of those needing dentures to the so-called denturist is becoming a major concern of the RCDS. If the licensing requirements were removed, the activities of denturists undoubtedly would increase. Denturists may practise legally in British Columbia.

To place as much emphasis on the fictitious working of a market system as the preceding argument does may seem naive. The market system in these cases may produce less than optimum results; it may have harmful and undesirable aspects. But it must be remembered that the present system, because it too has created some undesirable results, is also less than optimum. The intention of this line of argument is not to put the case for a return to the freedom of the nineteenth century, but to draw attention to a problem that is inherent in the present system of licensing. It would not be necessary to draw attention to this problem if it had received recognition in the past.

Conclusions

The inequities produced by the licensing procedure drive us to the conclusion that other measures are necessary to offset its undesirable aspects. There is evidence that the RCDS is aware of the problems inherent in the restrictive nature of licensing.[20] It is unfair to charge, as has been done in the past, that the RCDS uses its position to restrict entry to the profession. The restriction is dictated by the legislation which directs the RCDS to license dentists and to set the preconditions for entry to the profession. This has led, quite naturally, to concern being directed principally to the technical capabilities of new entrants, without sufficient concern for the number of these entrants or for those who are unable to receive dental services.

If the licensing function in its broadest terms is viewed as an attempt to make superior dental services available to the whole community, then it has partially failed in this attempt. It has succeeded in making a very high quality of service available to only part of the community. In principle, the remedy is simple — namely, to provide a mechanism by which these services are made available to the whole community. In practice, the solution (at least in the short run) appears impossible.

If the licensing function is not viewed in the light suggested above, it is incapable of justification. If neither the RCDS nor the government is prepared to view it in this light, then the suspicion that licensing is enacted for the benefit of the dentist and not the patient is justified. The threat of government intervention in the provision of health services may be seen as a threat of the profession's own making. The popular sympathy for government-supported plans for comprehensive medical and dental care has been created partly by the way the present licensing system works. Dental care plans are advanced by their advocates as a means of bringing these services to those who now cannot afford the benefits of modern dentistry. These measures would never have gained popular support if medical and dental services were more widely available.

In the case of dentistry in Ontario, this threat could be removed by imaginative use of legislation already at the disposal of the RCDS. The insular attitude

[20]From discussion with the members of the Board.

attributed to many dentists appears to have inhibited the RCDS from expanding its influence in the provision of dental services. The reason for this must be traced to the composition of the RCDS, a subject to be discussed later.

The licensing function, as we have already argued, is useless unless the RCDS also has control over education. As has been pointed out, effective control by the RCDS in this area is severely limited by its financial resources. Thus, part of the failure of the licensing function can be traced directly to the failure of the legislation to give the RCDS adequate financial backing to carry out its responsibilities. In this sense, the legislation respecting licensing is inadequate, just as it is inadequate in indicating the nature of the responsibilities the RCDS is supposed to bear. These responsibilities, therefore, involve some ambiguity for which the RCDS is not to blame.

Clearly, the intention of licensing is to raise the level of competence of those actually practising dentistry. Not so clear, however, is the answer to the question of how high a level of competence should be demanded. This is an important question and one that seems to have been virtually ignored. As the level of competence and training is raised, the costs of education rise rapidly and the numbers of those capable of attaining the requisite standard fall sharply. Quite simply, as the quality is refined, the number of dentists decreases. This is practically axiomatic under present institutional arrangements. The RCDS then, is faced with a trade off between numbers and quality, with very little guidance in making a decision. Since financial constraints prevent it from having any direct significant influence over numbers, the College has directed its concern towards quality. Numbers have been left to the government and the universities to work out, with the RCDS bringing moral suasion to bear wherever possible. Ultimately, the government decides the numbers of dentistry students, for virtually no provincial university could contemplate establishing a professional school without massive aid from the provincial government. To the extent that the licensing procedure has failed, the failure must be borne by the provincial government, and to the extent that it has succeeded, the success may be attributed to the RCDS and the universities.

What makes little sense is the *division* of success and failure. From the public's or the patient's point of view, "quality" and "availability" are aspects of the same service. The provision of a service should, therefore, be the responsibility of one authority, whose duties are clearly delineated. Unfortunately, the establishment of a single authority is beyond the realm of practical policy consideration. In any case, any arrangement that can be made will have to recognize the ultimate authority of the provincial government in the determination of university expenditures. But one might hope for a systematic and regular opportunity for the College to act in an advisory capacity regarding the adequacy of university training facilities, and of course, the creation of new dental schools. The position of the College could be strengthened considerably if the Dentistry Act contained a provision which required the College to review the position of the universities annually, or at some other

appropriate interval, and for the Minister of Health to table the report in the Legislature.

Such a report could go beyond a mere review of the number of dentists being trained. Used wisely, it could permit the College a modicum of indirect control over the professional faculties, providing it with an opportunity to express an opinion about the conduct of the dental faculties. Since this is a power that the College could abuse, the universities may react negatively to such a proposal. This procedure, however, would not expose them to a new threat. The submission of the College to the Legislature would carry with it no more significance to the universities than any other submission or comment in the legislature.

In fact, this procedure could place the dental faculties in a somewhat stronger position. In compiling its report the College would have to consult the universities; any legitimate grievances the dental faculties might express would become part of the report.

This procedure would greatly strengthen the College's power of moral suasion and would make government more sensitive to its advice. Further, responsibility for numbers would be more clearly defined, giving the public the opportunity to view the position of the various authorities involved in this issue. The College in its annual submission would have to make public its comments about the adequacy of the current training facilities. This would permit the public to form some sort of judgement about the age-old charge that the statutory bodies are concerned primarily with restricting entrance to the profession. If, as the author suspects, the charge is not valid, the image and authority of the College in the long run would be enhanced and the public might become willing to see greater executive powers extended to the College.

The possible benefit to the universities has been mentioned already. There is, however, an aspect and use of the annual report that has not been mentioned. Because of their special statutory position, the professional faculties are of special interest to the government, and to the statutory professional bodies. Governments in some countries have long been perplexed as to how special attention might be directed towards the professional faculties without intervention in university affairs. (In the United States, government influence on the universities has grown considerably through the use of grants.) The annual submission of the College could have a financial aspect as well. Elsewhere in this report it has been suggested and argued extensively that the College should become involved in the administration of funds. Here is one important way in which those funds could be administered. In addition to commenting on the adequacy of university training facilities, the College could submit a budget which it would administer, but the funds would be destined ultimately for the university faculties. This may seem a circuitous route to get government funds to the dental faculties but it has some marked advantages.

It has been noted that direct intervention in a university budget would be unacceptable to the universities. It should be noted also that if special funds come to a particular faculty but are administered by the university, there is the danger that the university will cut the faculty budget, thus making it difficult — perhaps impossible — for the particular faculty to receive special attention. The vehicle of the College would permit the individual dental faculties to approach the government for funds through a channel other than the university. This would be particularly important with respect to research funds.

This virtually concludes the comments we have to make on the licensing powers granted to the College. It must be emphasized that these powers cannot be made wholly effective until the College has some sort of control over education. Under the present institutional arrangements, it is difficult to decide how this control could or should be exercised. With respect to numbers, we have concluded with an observation which, although a truism, seems to have escaped many otherwise well-informed critics of the profession and of the College. This is the simple fact that the number of dentists which the College can license is closely related to the number trained by the dental faculties. Because this is the case, we suggest that the College be allowed to comment upon the adequacy of the training facilities. In the future, it should be hoped that the College will concern itself not only with the quality of dentistry in Ontario, but also with the number and distribution of dentists within the province.

The Disciplinary Function

The details of the disciplinary procedures are described elsewhere and there is no need for them to be reviewed here.[21] Our comments will bear on the role of the disciplinary function in the context of the College's general purpose.

The College possesses two distinct forms of disciplinary powers. On the one hand are those which extend to the members of the College; on the other, those which cover the illegal practice of dentistry. For purposes of exposition, only those which cover the members of the College will be discussed here.

The Alternatives

The disciplinary function should be an extension of the educational and licensing functions of the College. Its very existence is a realistic admission that control over education and licensing is not sufficient to ensure that the "public interest" is being served. What may not be realized, perhaps, is that a system could be devised in which dentistry is conducted without the College having any control over licensing or education and yet having rather extensive powers of disciplining and policing. Although this cannot be advanced as a serious alternative under present conditions, it does deserve comment because it underlines the paramount importance of the disciplinary function.

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[21]B. Westlake, *op. cit.*

The present system of licensing and education is an attempt to ensure that no one takes up the practice of dentistry unless he is capable of meeting certain standards of competence. As has been pointed out before, the underlying assumption of the present system is that once in practice the dentist will be so motivated that he will perform to the limit of his capabilities. Therefore, there has been virtually no policing of the dentist once he is licensed. An alternative would be to permit anyone to pracise dentistry, but to institute a thorough and systematic policing of all practising dentists with strong disciplinary measures available to the policing body.

If the policing of the practitioners could be made effective — and this is a rather big *if* — and if the disciplinary measures were sufficiently severe, only those suitably qualified would engage in dental practice. Entrance to the profession would be more varied, of course, but one would expect the majority of dentists to be university trained. Such a system probably would produce a host of practitioners who offered to perform only limited dental services. For example, a class of practitioner could develop which specializes in the provision of dentures.

Whether or not this would be in the "public interest" would depend upon how well these people performed the services they offered and on the price at which these services were made available. The desired standard could be achieved through ruthless action against substandard practitioners. Given that the policing were adequate and the penalties appropriate, the public interest could be protected. Even in this idealized model, however, certain problems emerge which make the transition to the real world almost impossible. The first and most difficult obstacle is how the policing is to be conducted. There would seem to be three alternatives.

First, the authority could wait until formal complaints were lodged against practitioners and then take action on the basis of these complaints. Clearly, this would be inadequate because, as we have argued, part of the justification for the licensing procedure is that the patient often does not know he has been the victim of malpractice.

Second, the authority could make use of an inspector who would actually visit the operation during working hours and watch the practitioner ply his craft. This would arouse many objections — some are valid, some are not. When this suggestion is seriously advanced, members of the profession have been quick to point out that it discriminates against those who are sensitive to pressure, because under the scrutiny of an inspector they may not perform well. This seems invalid because first, the training procedures now used place the student under continual scrutiny, and yet the teaching methods are not faulted for this reason. Second, there are a great many cases in which the dentist must work under "pressure"; therefore, pressure cannot be considered an abnormal aspect of the practice. The real weakness of this proposal is that when the inspector is present, the dentist may well perform to the limits of his capabilities and at this level of performance his work may be satisfactory. When the inspector is absent, however, his standards may

decline. Inspection of work in progress is not a means of judging the general performance of the practitioner.

The last way in which regular checks could be run on the dentist would be to require from him a patient list and to regularly inspect random patients from this list. Obviously, this would be expensive and difficult, but it would have the advantage of permitting the authorities, if they wished, to have a much wider view of the dentist's performance. Here, shoddy work for which there may be a valid special reason — a particularly difficult child, say — could be recognized for what it is — a special case. The importance of such a system is not the actual inspections, but the knowledge on the part of the dentist that his work is apt to be inspected and evaluated by other professions. It must be emphasized again that the present nature of the practice relieves the dentist from the scrutiny of his equals. Most other medical professionals, performing very often in the context of a hospital or clinic, are surrounded by professional colleagues.

If we are to rely simply on the threat of disciplinary action to protect the public interest, only this last form of inspection would be adequate. In practice, of course, it would display many inadequacies. If dentists were inclined to report to the authorities any work which they thought was inadequate, this system of inspection would be greatly enhanced. The profession presently lacks any element of self-inspection. In fact, the dentists' Code of Ethics explicitly places criticism of one's colleagues beyond the bounds of professional conduct. Whatever its intentions, this official pronouncement discourages internal policing of the profession by individual members. Its only advantage seems to be that it eliminates irresponsible accusations. If, however, there were a powerful disciplinary authority to which to report, irresponsible accusations could be easily refuted and thereby discouraged.

Which of these possible forms of carrying out a necessary aspect of disciplinary function are appropriate in the present context? The College now depends upon the one form which the justification of the licensing function suggests cannot be relied upon: patients' complaints. The College also shares an inspector with the College of Physicians and Surgeons, but he normally responds only to complaints. These complaints relate mainly to illegal practice, infraction of the by-laws regarding signs and advertising, and unhygienic premises. No regular inspection is undertaken of dental offices, although the Board has sought the power to employ a person to do this. Under no circumstances is an attempt made to actually inspect the performance of a dentist unless disciplinary action is being brought against him.

It is not surprising that few dentists have ever been brought before the Discipline Committee for reasons of technical incompetence. The fact is that the Discipline Committee has virtually no means other than patient complaints to find out if a dentist is technically incompetent, and patients do not have adequate knowledge to judge their dentist's technical competence. This leads to the conclusion that, at best, the disciplinary function of the College is being only partly fulfilled. The situation that exists within the profession would be roughly parallel to

a society which had laws and law courts but no police or enforcement agency. As a result, the Discipline Committee has dealt primarily with cases involving "ethics" and there appears to be a growing belief that, because no cases involving technical competence come before the Discipline Committee, technical competence is not an important issue. This contrasts rather vividly with the opinions held by some practitioners about the level of technical competence of some of their brethren.

It is impossible to believe that the disciplinary function of the College is being carried out adequately when the College has no effective means of inspection. This is a necessary adjunct to the functions of the Discipline Committee. The College has equivocated too long on how this inspection might be carried out. It must end its search for an ideal solution and content itself with a workable solution. A few possibilities are discussed, and some are dismissed, below. Let us start, however, with the general premise that inspection can take place whenever one dentist has the opportunity of viewing another dentist's work.

The Travelling Inspector

For the reasons already discussed, we can dismiss the travelling inspector as a primary means of policing the profession. An inspector, however, could provide a very important auxiliary service in a scheme which involved other forms of policing. He could determine those cases in which the dentist is incapable of providing adequate services even when he is performing at his best. For reasons of age or physical or mental handicaps, some dentists may well become incapable of providing a standard of service which approaches that demanded of the new entrant to the profession. Hopefully, the number of such cases would be and probably is relatively small. The problem is, however, that only subjective estimates are available as to just how serious a problem such cases are.

Special Studies

It has been the experience of the author that subjective estimates of the problem vary to a remarkable extent. Therefore, an inspector should be appointed by the Board to undertake a study of this problem. One class of dentists that appears to require study is the elderly dentist. If a broad study of the profession is not feasible, then serious consideration should be given to doing a study of the competence of older dentists.

It probably would be inappropriate for the Board to undertake this study itself. It should contract with a university or with an agency outside the province to have the study done. Whatever the terms of the study, they must include explicit reference to the desirability of appointing an inspector. If the College is not prepared to assume the responsibility for such a study, then some other responsible agency should do so. The fact that the College has not attempted an objective assessment of the technical competence of older dentists, although it has expressed

some concern about the problem, suggests a fundamental deficiency in the attitude of the College with respect to this matter. Historically, the College has demonstrated a reluctance to single out a particular segment of the profession for examination. This attitude is in conflict with the general responsibility of the College to protect the public interest. The members of the College should display no hesitation in exposing segments of the profession to special scrutiny, and it is to be hoped that the College will escape these mental shackles and undertake a study of the competence of the profession as a whole, or at least of those segments which deserve special consideration.

One of the principal reasons why no such study has been undertaken is the mistaken belief held by some members of the College that studies or scrutiny of this sort "interferes" with the "rights" of the individual dentist. This notion of rights is purely illusory. No dentist has such rights. In fact, he is granted a licence only on the fulfilment of certain conditions. A special study and perhaps the eventual appointment of an inspector are nothing more than an attempt to determine whether or not these conditions are being met.

When a study is seen in this light, we have the basis for reforming the Discipline Committee. Under the present system, it is essentially a tribunal and under any conceivable system this aspect of its work will remain of paramount importance. The Discipline Committee, however, is the logical body to undertake the study of broader aspects of the regulation and control of the profession. A strong case can be made for involving the Discipline Committee continually in specific studies, or for it to sponsor studies undertaken by others. Only through continual study of the profession can adequate standards of technical competence be evolved.

Apart from the reluctance to subject the profession to scrutiny, one of the principal reasons why the issue of technical competence does not arise more often is the absence of criteria. This is reflected in the widely varying evaluations of the general level of competence made by members of the profession themselves.

These comments on the need for a study of the older dentists suggest the second important method that the Board has at its disposal for ensuring that standards are maintained in practice — the use of special studies. These studies can be used only to probe broader issues; but properly designed, they could provide an invaluable adjunct to the work of the Discipline Committee itself. Most important of all, they would release the Discipline Committee from the role of mere tribunal and place before it a new and important responsibility which the College most certainly has, but which it is not meeting. This responsibility can be stated as the systematic and objective evaluation of the profession.

We now have two possible tools designed for very different uses which could assist the Discipline Committee in carrying out its functions — the travelling inspector and the special study. Neither of these alone is an adequate tool for the job before the Committee. The travelling inspector, at best, could bring to the

attention of the Committee only the most flagrant cases of incompetence, while the use of special studies could indicate only "problem areas".

Penalties

In view of the reconstruction of the Discipline Committee proposed here, there is a radical form of inspection that the College could undertake which would have some real virtues. First, however, it may be useful to consider the type of penalties the Committee can extract. Under the Act, the Committee can fine a dentist, or cancel or suspend his licence. None of these penalties can be regarded as remedial when the actions of the Discipline Committee are taken for reasons of technical incompetence. The first reaction of the Committee when confronted with a case of incompetence should not be to drive the offending dentist out of the profession; but under the present statute, the Committee, apart from fining him, has little choice. If anything, to suspend the man probably would intensify his crime in the future. Fining is obviously a very blunt and clumsy instrument, and can hardly be considered a means of rectifying incompetence.

From these remarks emerges a third reason why the Committee is reluctant to become deeply involved in the question of technical competence. Once a man has been found incompetent, the disciplinary procedures provide for no *reasonable* action against him.

Re-education

Incompetence normally arises because of the gradual erosion of skills. To deal with a case of incompetence, the Discipline Committee needs some means by which it can reverse the effects of this erosion. The means of doing this is, of course, re-education. The problems involved in re-education are very considerable, however, and no minor variations in the structure of the profession will be sufficient to deal with them. The universities as a centre or focus for re-education thus may be eliminated.

There are many reasons why the universities should not be involved in the re-education of dentists. Among these are the structure of the academic year, the location of the universities, the pressure of space within the dental faculties, and the nature of instruction. But perhaps most important is the atmosphere within the university and the ignominy of having to return to such a place for re-education. Some type of centre or clinic is needed in which the dentist could concentrate his attention on those areas in which his skills have deteriorated. Although there is simply no evidence to suggest either the extent or the prime cause of technical incompetence, the deficiencies very likely occur in the areas of diagnosis, digital skills, and the use of new materials.

Elsewhere we shall devote considerable attention to the question of where the retraining could or should take place. Let us now suppose that retraining is feasible and that the Committee could insist as a condition of continued licensure

that someone found guilty of technical incompetence be required to undergo retraining. The logically prior question is, how can one establish that a dentist is incompetent? There are several alternatives.

Once a dentist had been charged as or is thought to be, incompetent, evidence concerning his competence could be assembled in two ways:

1) By assessment of the work he has done; that is, by investigating some of his patients.
2) By direct examination, perhaps the comprehensive examination required of new entrants to the profession or perhaps by examination in some specific fields.

What emerges from this is the simple fact that the man must be evaluated. While the evaluation is apparently extremely repugnant to some members of the profession, it is inescapable if we are to confront the problem of incompetence.

There is still the problem of identifying those who are to be subject to examination. There are two distinct possibilities. Some means may be devised by which these individuals can be identified, or every member of the College can be examined periodically. It is the author's view that only the latter alternative is practical.

All dentists might be examined, for example, during their fifteenth, twenty-fifth, thirty-fifth, fortieth, and forty-fifth years after graduation. Under such a scheme, the typical dentist wishing to practise until age sixty-five would be examined four times during his professional life. This surely is not an excessive demand on his time, nor does it represent much of an intrusion on his "freedom". Only those who are actually incompetent would have anything to fear.

If as a result of these examinations a dentist appeared to be technically incompetent or deficient in some particular area, a number of courses of action would be open to the Discipline Committee. He could be given a period of grace in which to attempt to remedy his deficiencies by studying or attending courses on his own. After the period of grace he could present himself for further examination. If at this stage he satisfied the Committee that his technical deficiencies no longer existed, no action would be taken. If, however, he still appeared to be deficient in some areas, the Committee might direct that to retain his licence he must attend some form of retraining program. Even after the retraining program had been successfully completed, the Committee might require re-examination every five years.

Considerable benefit could result from these examinations, quite apart from the discovery of the incompetent. The knowledge that he would have to face an examination in the future would induce the dentist to keep abreast of developments in the field, to consciously avoid developing sloppy habits, and in some cases might induce him to attend continuing education courses prior to writing his examinations.

Conclusions

The elements of a satisfactory policing method are now emerging. It is worthwhile stating them again to see how they all fall into the general pattern. First, the travelling inspector represents a continuing pressure to maintain standards from day to day. The likelihood of his arriving on the premises is very small, but it is still there and must be contended with. In addition to observing the conduct of the dentist, he will be in a position to inspect the operation and the dentist's assistants. Second, the special studies are designed to detect problem areas and to generate information about the profession to guide the Board in framing appropriate by-laws. Third, the periodic examination of the dentists themselves are an explicit attempt to evaluate the individual dentist.

To these formal elements must be added two more. The fourth element in the policing system will be the patient. He must be given the right to lodge complaints against the dentist and have these complaints acted upon. Further, the inspector and the Discipline Committee should provide the patient with a statement of the action that is taken in response to his complaint. The fifth element in the policing system would be undoubtedly the most difficult to implement, partly because of the traditions of professional conduct. It would involve dentists reporting to the Committee any examples of incompetent work which they might discover. If the Committee could act discreetly, such a system would not expose any dentists to unjust harassment. In fact, if this method of self-policing were now operating, any other form of policing might prove unnecessary.

The approach to the disciplinary function taken here is basically different from that taken by the College. Historically, the Discipline Committee, which is primarily responsible for this function, has seen itself as a tribunal. We argue that this is far too narrow an interpretation of this function and that the Committee must see itself as the guardian of the standards of the profession. This is its true responsibility. If the College is not prepared to see the disciplinary function in this light, the purpose of the College must be called into question. Whether the Board has exercised this function in the past is highly debatable, for no one knows what standards practising members adhere to.

The policing system outlined here contains many imperfections. But if the College cannot see fit to adopt it in part or in whole, it must come up with a viable alternative. If it rejects this scheme and proposes and implements no alternative, it must be judged to be failing in one of its responsibilities. The fact that the decisions that must be made are difficult decisions does not relieve the Board from its responsibility.

Chapter 9 The Structure of the Royal College of Dental Surgeons

In broad terms the Dentistry Act sets the administrative structure of the Royal College of Dental Surgeons, and, again in broad terms, defines the relationship between the College and the members of the profession at large. The traditional practice has been to adhere scrupulously to the stipulations of the Dentistry Act.

The Board

The Dentistry Act divides the province into eight electoral districts. Until recently each district elected from among those resident in the district one member of the Board; a recent amendment to the Dentistry Act provides for the election of two members from the District of York. In addition to the nine members of the Board, each dental faculty is entitled to elect a member to the Board. There are, therefore, eleven elected members on the Board, nine of whom must be dentists; it does not appear that the members elected from the dental faculties must be dentists, but they have been in the past. The Ministers of both Health and Education are ex officio members of the Board. There is no record of either Minister being present at a Board meeting; it seems unlikely that the Ministers have first-hand knowledge of the activities of the Board.

At the first meeting after an election, the Board is required to elect a president and vice-president and to appoint a registrar, treasurer and secretary. Traditionally one person has been appointed to hold these last three positions and has, in fact, become a permanent appointment of the Board.

The Board must appoint annually an Executive Committee of not more than five members of the Board. As the name suggests, the purpose of this committee is to exercise executive power; it does not have the right to alter, amend or suspend by-laws and any action taken by it must receive the ratification of the full Board. Concurrence of any three members of the Executive Committee is sufficient to initiate executive action.

Traditionally the Board has met three times a year, but in the most recent year four two-day meetings have been held. In view of the increasing complexity and activity within the profession, it seems likely that four full meetings of the Board each year will become the rule rather than the exception.

The principal function of the full Board meeting is to hear, consider and act upon reports submitted by the committees of the full Board. Through the judicious

use of committees, the Board is able to hold the number of full meetings down to a minimum. Presumably this minimizes the bickering which might take place at a full Board meeting. This seems a wise and sensible policy, but it does result in the transfer of some of the Board's powers and functions to committees. It is from the committees, therefore, and not from the full Board that one would expect policy changes to emanate. The vitality of these committees is crucial to the performance of the Board. The committee responsibilities are spread among the members of the Board fairly evenly, although some individuals have, at least on paper, rather more than average duties. Most members of the Executive Committee reside within reasonably short commuting distance of Toronto, but some Executive Committees have contained members from the more northerly reaches of the province. In view of the functions of the Executive Committee, it seems both sensible and natural that it should draw most heavily on those located near Toronto for its membership.

The number and nature of the committees could vary from year to year. There is nevertheless a core of permanent committees. As mentioned, the Dentistry Act provides for the creation of an Executive Committee; it also makes provision for a Discipline Committee. The remaining committees may be disbanded, or new ones may be created at the discretion of the Board.

In recent years the Board has maintained six committees in addition to the Executive and the Discipline Committees. Their titles suggest their activities: Government and Legislation; Registration and Licensure; Finance; Property; Dental Services; Continuing Education.

The Board also appoints representatives to a variety of other bodies. In some cases, as with the representation on the Council of the Faculty of Dentistry and the Senate of the University of Toronto, this right to representation is protected by legislation, but for the most part it stems from traditional practice and mutual agreement. Normally, the Board has representatives on the following bodies:

Council, Faculty of Dentistry, University of Toronto
Senate, University of Toronto
National Dental Examining Board of Canada
Dentists' Legal Protective Association of Ontario
Canadian Dental Association
Executive Council, Ontario Dental Association
Library Committee, Faculty of Dentistry, University of Toronto
Admissions Committee, Faculty of Dentistry, University of Toronto
Scholarships and Awards Committee, Faculty of Dentistry, University of Toronto
Consultants to Curriculum Development Committee, Faculty of Dentistry, University of Western Ontario

The list shows that most of the representatives of the Board are in some way associated with the Faculty of Dentistry at the University of Toronto. The use of "representatives" on decision-making bodies in the faculty is striking.

This list of representative positions reveals an unfortunate absence of formal contact with bodies within the healing arts, other than those concerned directly with dentistry. To be fully effective, the formal contacts of the Board should extend well beyond the peripheral areas of dentistry. Two areas in which the Board should certainly have formal contacts are the medical profession and the hospitals. To realize effective representation in these areas, the Board should be given the necessary supporting legislation. Just how such representations should be established is a delicate matter and something which the Board itself should consider and comment upon. An extension of the Board's representation into the activities of the medical profession, for example, would probably have to be reciprocal.

Clearly, dentistry is not an island unto itself; but it is in many ways unique and easily differentiated from the other healing arts. The problem for the Board and for those who create the statutory framework of the healing arts is to determine where and how the power of the Board ought properly to extend. They must also consider the concomitant problem of how sensitive or exposed the Board ought to be to the influence of non-dentists. Part of our study of the present composition and administrative structure of the Board will be the assessment of its function in terms of the coordination of all the healing arts.

This assessment must include also comments upon the effectiveness of the Board in solving the internal problems of the dental profession and in protecting the public. It is clear from the committee structure, which generates most of the Board's policy analysis and recommendations, and from the nature of the Board's membership, that its concern usually is directed to the internal problems of the profession. Since we have commented already upon the internal problems and have outlined a general remedy for many of them, our remarks here will be restricted to the impediments placed on their solution by the composition and administrative structure of the Board.

The Relationship of the College to the Profession

Historically, the relationship between the Board, and the College and the profession has not caused concern. Recently, however, the Board has become aware of its rather peculiar relationship with the profession. It has, in fact, been fulfilling many of the functions that should have been left to a voluntary association, in this case to the Ontario Dental Association. Unfortunately, the ODA has displayed many of the weaknesses of voluntary associations. Much of this weakness, if not all, has stemmed from inadequate financing rather than from an inability to attract candidates for executive positions. Since the Board, through the vehicle of the licensing fee, has had a predictable and dependable financial base, it has

assumed many of the functions unfulfilled by the ODA. By the early 1960's, both the Board of the RCDS and the ODA recognized the unhealthy situation; in 1963 they jointly engaged a management consultant firm to review the "organizational structure of the dental profession in Ontario",[1] and to make recommendations. The findings and recommendations were implemented or are in the process of being implemented by the ODA and the RCDS.

While the principal purpose of this report is to be critical, it is difficult to pass over these events without a word of praise. They indicate the Board's awareness of its proper role in the administrative framework of the profession. One must wonder, however, if the statutes show the same clarity.

Protection of the Public Interest: the Dilemma

The purpose in creating the RCDS was, as we have often emphasized, to protect the public interest. To realize this lofty but nebulous goal all dentists must fulfil the conditions required for registration with the College. Upon registration they are entitled to vote and stand as candidates for the Board. To win election to the Board, a candidate must appeal to the electorate, in this case, to the members of the College. Re-election presumably depends upon keeping faith with the members of the College. How then can a member of the Board be expected to act in any interests other than those of the dental profession? The Board, by its composition and by its selection, has an implicit responsibility towards the members of the College, and they are indistinguishable from the dental profession. Traditionally, therefore, the Board has served as the governing body of the profession, acting principally in the interests of the profession.

Naturally, the interests and welfare of the individual members of the profession and those of the public cannot be expected to coincide neatly. At the best of times there will be a conflict of interests. The public is now in the peculiar position of having its interests protected by a body elected by "the other side". The individual Board member is caught in a dilemma. The statutes charge him with the defence of the public interests, whereas his position on the Board is contingent on the support of the College.

Past Boards generally have adhered to the statute, but this is a comment on the strong character of the Board members rather than on the mechanics of the administrative and legislative process within the dental profession. It is in the interests of both the Board and the public to relieve members of this dilemma. The method of selecting Board members must be altered so that no conflict of interests hampers them in making judgements on the public interest.

If public demands for government sponsored health plans continue to increase, or if such plans are implemented, the members of the Board will undoubtedly

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[1]Woods, Gordon and Company, "A Review of the Organizational Structure of Dentistry in Ontario", Toronto, 1963.

be exposed to increasing pressure from the College to act on behalf of the College. Those who hold out against these pressures likely will not survive the next election. Appealing to the past as an example of how effective the Board can be in protecting the public interest is irrelevant. The future with which the Board must cope will be very different from the past.

Members of the Board should be insulated from the demands of the members of the College. If the dental profession has demands to make on the Board, the public or the government, the proper vehicle is the voluntary association, not the statutory body. This principle was contained in the Woods Gordon Report. By accepting the findings of the Report, the RCDS and the ODA appear to have supported it. It is also the principle on which, presumably, the Dentistry Act was founded.

In spite of the Board's acceptance of this principle, it seems beyond question that in any dispute between the dental profession and the provincial government, the Board of the RCDS would become involved on the side of the profession. An example of such involvement occurred during the passage of Bill 163 through the provincial Legislature.

The Board presented a brief to the Committee of Enquiry dealing with, as it then was, "an Act Respecting Medical Services Insurance". This seems well within the limits of the Board's competence, and it is desirable that the Board take a position on matters which interest it, or in which the dental profession has an interest. In this particular case the Board recorded strong opposition to certain aspects of the proposed legislation. As a body endowed with statutory powers, the Board's representation should have ended there. When Bill 163 had passed its second reading, however, the Board sent to every member of the provincial Legislature both a copy of its submission to the Committee of Enquiry and a covering letter designed to explain the Board's opposition to the Bill. By this action the Board clearly cast itself in the role of a pressure group and mounted a lobby on the behalf of the profession. It had ceased to advise the government and had undertaken a course of political opposition, as a spokesman for the profession. This incident points up the confusion of the Board's role, and the peculiar position in which the Board currently finds itself. The ambiguity of its position can be further illustrated by a statement of the Chairman of the Board during the hearings of the Committee on the Healing Arts.

> . . . the legislature of Ontario, in its wisdom, has given the privilege to and placed the responsibility on the dental profession itself to administer the statute under which dentists practise. We are ever mindful of this important fact and are diligent and conscientious in the discharge of the obligations which such a trust entails.[2]

In this statement the Chairman of the Board sees the College as an agency responsible for the discharge of statutory obligations. This role, which is the

[2]The Committee on the Healing Arts, *Proceedings,* April 3, 1967, p. 1862.

proper role for the College and for the Board, is not consistent with the role of pressure group or spokesman for the profession. As implicitly recognized by the acceptance of the Woods Gordon recommendations, this latter role should be left to the Ontario Dental Association.

The ambiguity of the Board's position will remain as long as the Board is elected by members of the profession. As the Board is presently constituted, it may quite understandably feel a responsibility towards the profession which may take precedence over some of its rather vague responsibilities towards the public. The position of the Board should be clarified and it should be given the freedom to exercise its responsibilities independently of the view of the profession. If members of the Board find themselves unable to support government policy, they should not, as members of the Board, resort to direct political action to oppose that policy. This is inconsistent with their role as administrators of government legislation. In cases of violent opposition, they should feel bound to resign and to pass their positions on to those who can discharge government policy conscientiously.

The resulting confusion over the Board's role calls into question the efficacy of having the members of the Board elected by the members of the profession. Nevertheless, it is our view that there are considerable benefits to be derived from having *some* members of the Board elected by the profession. What is called for is a change in the traditions followed by the Board. The Board members must be encouraged to adopt the attitude that they are in fact elected to administer the Dentistry Act and that their activities with respect to government are limited strictly to advising. Such a change will require some change in the composition of the Board. The appointment to the Board of distinguished citizens who may or may not be dentists, but who can bring to the Board an attitude and tradition of public service, would be one way of effecting a change of attitude among Board members. To avoid increasing the size of the Board it may be desirable to reduce the number of elected dentists presently on it.

The General Dental Council

This suggestion resembles in some respects the General Dental Council in the United Kingdom. This body, which was established by statutory provisions, has many of the same responsibilities as the RCDS. Its relationship to the profession is substantially different, however, so that any pressure exerted on the GDC by the profession must be very subtle indeed. The British Dentists Act sets forth the functions of the General Dental Council in great detail but, apart from the limitation of the statutes, the Council appears and believes itself to be free from direct government intervention in the conduct of its affairs. It has the type of independence from both the government and the profession that would be desirable for the RCDS. Much of this independence is assured by the traditions prevalent in the United Kingdom, by the vigorous and active British Dental Association, and by the composition of the Council itself. The strength of the British Dental Associa-

tion makes it unnecessary for the profession to attempt to confront or confound government policy through the vehicle of the General Dental Council; the composition of the Council makes it unlikely in the extreme that it could ever be used for these unintended purposes.

The General Dental Council provides a successful working model that could be emulated to good advantage in the revamping of the RCDS. Most important in this respect is the composition of the Council. The Dentists Act provides that the members of the Council shall be as follows:

> 2. 1) The General Dental Council shall consist of eighteen members, together with the members to be nominated under this Part of the Schedule by the authorities who are for the time being dental authorities;
>
> a) eleven shall be elected by registered dentists from among themselves;
>
> b) three, who shall be registered dentists, shall be nominated by Her Majesty on the advice of Her Privy Council;
>
> c) three who shall not be registered dentists and, of whom, two shall be chosen for England and Wales and one for Scotland, shall be nominated by Her Majesty on the advice of Her Privy Council;
>
> d) one, who shall not be a registered dentist, shall be nominated by the Governor of Northern Ireland;
>
> and of the remaining members, all of whom shall be registered dentists, the University of London (so long as it is a dental authority) shall nominate two, and every other authority which is for the time being a dental authority shall nominate one.

Clearly, those who are either dentists or are engaged in teaching dentistry dominate the Council. During field interviews held in London, however, it was stressed (by dentists) that the nominated and non-dentist members of the Council play a greater part in the affairs of the Council than their numbers would indicate. Those interviewed felt that the successful role played by these members was due to their high calibre and to the diversity of background they brought to the Council.

Roughly, the Council can be broken into four distinct groups:

1) dentists elected by the profession;
2) dentists nominated by the Crown;
3) non-dentists nominated by the Crown;
4) the nominees of the dental authorities (usually dentists).

The presence of dentists elected by the profession ensures that there is representation on the Council of those who are familiar with the technical problems involved in the practice of dentistry. These members provide a voice for the profession in the Council. It seems clear that persons of their particular background can be secured only through election by and from the ranks of the profession. The dentists nominated by the Crown, on the other hand, can bring to the Council the requisite background without the encumbrance of responsibility towards the profession. They also may have the distinct advantage of representing less con-

ventional views of the profession than may be typical of the elected members. If these members are wisely chosen, there is a greater possibility that balance will be achieved in the presentation and resolution of issues relating to the profession. The non-dentists appointed by the Crown are valuable principally because they have not previously been involved in dentistry, and they can bring to the Council diverse administrative and technical experience. The last group, the nominees of the dental authorities, serve an obvious function, equivalent to that of the representatives of the Faculty of Dentistry of the University of Toronto on the Board of the RCDS.

Conclusions

If the Board of the RCDS could be modified along the lines of the General Dental Council, it seems likely that the objectives of the Woods Gordon Report — a clear and rational division of function and purposes between the Ontario Dental Association and the RCDS — would be rapidly realized. Whether this objective could be fully realized in the present circumstances may be doubted. The statutory and financial powers of the RCDS give it the power to discipline members — and also give it strong similarities to a powerful labour union. In times of stress between the profession and the government, these powers and the unique position of the RCDS makes it the natural vehicle, from the point of view of the profession, with which to confront government. Its ability to control entry to the profession and to discipline members ensures that a united front is preserved and, through this, that the bargaining power of the profession is maximized.

The ability of the RCDS to regulate entry and to discipline members has not been used this way, and the RCDS should be commended for its past behaviour. All the healing arts, however, are entering an era in which the relationship between the professions and the government is likely to become more strained. For this reason the past has little relevance in preparing for the future. The belief that the disciplinary powers of the RCDS could never be used to discipline members for quasi-political activities is naive. There are countless examples of bodies with disciplinary control exercising these powers for just such a purpose. The ability of the RCDS to take disciplinary action for unprofessional behaviour — whatever that means — provides wide enough grounds on which such action could be taken.

In fact, there is on record in the files of the RCDS a case in which a dentist faced disciplinary action for publicly criticising his confreres. In this case the criticism was undoubtedly unjust, belligerent and irresponsible, but the attitude of the Discipline Committee of the Board was that members of the profession should not indulge in the spectacle of using the mass media to attack one another. Should the RCDS be in a position to threaten the right of free speech? Whatever the answer, this incident demonstrates the power which the College possesses. This power must never be permitted to either frustrate or further political ends. The decorum of the profession or the adherence of the individual members to a code of ethics should be left to the ODA; the RCDS is properly concerned with

the standard of dentistry and with ethics only insofar as they affect this standard of practice. This is surely the proper view of the role that the RCDS should play, but it is hardly the prevailing view.

In summary, it is our opinion that the role of the RCDS and particularly of the Board vis-à-vis the profession is untenable; this has been realized by the Board in its acceptance of the Woods Gordon Report. The measures which the Board has adopted to divest itself of some of the responsibilities of the voluntary organization should be reinforced by changing the composition of the Board. The Board then would never be expected to assume a role that should be left to the voluntary association. The model which in some respects recommends itself is the General Dental Council in the United Kingdom.

Relationship of the College to the Public

As a defender of the public interest, the RCDS may be expected to have some sort of relationship with the public, or at least some form of contact with the public, which will keep it informed as to what is happening to the public interest. In turn, one may expect that the public would have some knowledge of the policies and of the action of its champions. If these are one's expectations, one is apt to be very disappointed.

When talking about the "public" we have introduced a high level of generality, and if we continue to maintain this level of generality, it is fair to say that the public is unaware of the existence of the RCDS. Even those who are aware of the existence of such a body generally have little idea of what it does. (Most dentists are aware of the RCDS, but it is surprising how many are vague about its purpose and function; many appear to regard it as the defender of their interests, sometimes against the demands of the public.[3])

It is hardly surprising that the public is not aware of the RCDS. It seems to have been the traditional policy of the RCDS to avoid publicity in the mass media, especially when the issue is apt to excite public interest. It is difficult to determine if the lack of public interest in the RCDS has been detrimental, for even under the most favourable conditions public interest would seldom, if ever, be strong enough to provide effective scrutiny of the Board (in the same way, for example, that public interest is assumed to work on the provincial Legislature). What we may realistically hope for is that nothing will unnecessarily hinder a member of the public from finding out what the Board's policies are and what action the Board has taken. The traditional policies of the Board, however, do place very real obstacles in the way of a member of the public (and indeed of the profession) finding out what policies are being pursued by the Board.

Board meetings normally are closed and a member of the public would not be permitted simply to walk in and observe the proceedings. The Board sometimes

[3]This opinion was expressed during discussion with the Board and officers of the Board.

permits outsiders to sit in on a meeting, but generally the outsider must have some very explicit reason for wishing to do so.

The proceedings of the RCDS are published annually, but these are not minutes in the usual sense of the word, and do not indicate the position taken by individual members of the Board on specific issues. The minutes of the Executive Committee are not published and are not readily available to the public.

Needless to say, the Board is not in the habit of hearing or being addressed by members of the public during its meetings. Representation can be made to the RCDS through a letter, and presumably a member of the public could submit a brief to the Board.

There seems to be no good reason why the activities of the Board could not be made more public. Although it is doubtful that members of the public would care to attend Board meetings, it may be healthy for these meetings, or at least some meetings, to be open to them. These meetings could take two forms: one in which the public was simply permitted to observe the proceedings, comparable to the relationship between the public and the provincial Legislature; and one in which the public, by giving prior notice, could address the Board on a specific issue, comparable to the conduct of a municipal council. Administrative efficiency demands that the Executive Committee be able to meet when necessary and probably without the surveillance of the public. The full Board would probably find that occasions arise in which it seems appropriate that an issue be freely discussed, without members of the Board being exposed to the public.

Beyond removing the shroud of secrecy which envelops it, there are few practical measures that the Board can take to encourage public interest in its activities. There is probably much to be said for the traditional practice of attempting to avoid the sensationalized publicity of the popular mass media, and it is a practice which should continue. Because many of the problems that the Board has to deal with require technical knowledge of the practice of dentistry, it is important that the Board be as free from the inhibiting effects of uninformed public opinion as it must be from the pressures of the profession. The whole purpose in erecting the RCDS is to create a body which can reach decisions on rational, well-informed grounds. Therefore, if the Board permits the public to observe or participate in some of its functions, it should at the same time construct defenses to preserve its freedom of action. The ideal role for the Board is a difficult one. It must remain sensitive to the public, to the profession and to the government, and yet, paradoxically, it must remain independent of each of these groups if it is to perform its function successfully.

The Relationship of the College to the Government of Ontario

There are two government departments whose general policy could greatly affect the ability of the RCDS to carry out its statutory responsibilities. These are the Department of Health and the Department of Education. From the examination of

the statutory responsibilities of the RCDS, it should be clear how the policies of these Departments impinge upon the RCDS. Technically, within the limits of the Dentistry Act, the RCDS is an autonomous body which has no responsibilities to report either to the provincial Legislature or to any government department. It is our view that this traditional autonomy should be preserved and strengthened if the reforms discussed elsewhere are implemented.

The College as a Government Agency

The consequences of weakening the autonomy of the RCDS could be serious. If it were made responsible to a government department, there first arises the question as to who is ultimately responsible for the formulation of policy. The activities of the RCDS, especially with respect to standards and education, make it mandatory that the Board enunciate policies and put them into practice. If the Board is restricted to administering policies formulated by the government, it will become difficult to ascertain what policies are actually being put into effect and who is responsible for the consequences. If the enunciation of policy is separated from the administration of policy, the government department which creates the policy is given the opportunity to evade its responsibility by blaming the RCDS for administering the policy poorly. Likewise, the RCDS can evade its responsibilities by blaming the department for formulating inappropriate policies. In short, an unnecessary element of bureaucracy is created. If the attitude prevails that the government should have responsibility for formulating policy, then the responsibility for administering that policy should rest with the government; there should be no need to shift the responsibility to a body such as the RCDS.

There are, undeniably, some attractive reasons why the responsibilities now vested in the RCDS should be assumed by government departments. First among these is the ultimate accountability of the government department to the democratic process. This, however, involves a very real danger. It exposes the dentist to the prospect of direct government control and ultimately to the sway of public opinion. It has been argued earlier that the individual is not competent to judge the quality of dental services that he receives, and for this reason control over the profession and the standards of practice is desirable. Having once established and accepted this principle, it is difficult to see how, in his capacity not as a patient but as a voter, the individual can acquire enough knowledge of the profession to determine the policies which are to regulate and maintain standards of practice. It is the recognition that these issues require a level of technical knowledge that justifies the independence and autonomy of the RCDS. The public does not have the specialized knowledge to legislate on these matters; and it would be folly to expose the creation of the relevant policies to the sway of public opinion. (This comment applies only to those aspects of health legislation that the RCDS now undertakes to perform — namely, the determination and enforcing of the standards of the practice of dentistry.) This is the rationale for setting the RCDS outside the arena of politics. Even if persons with similar technical expertise could be recruited

within the civil service, it seems unlikely that they would be left to make decisions free from extraneous political considerations. Moreover, since the dentist is intimately concerned with the decisions made concerning the standard of practice, it is important that the profession feel it is participating in some way in the setting of these standards. Great hostility may be generated if the standards are imposed from the outside.

Of course, an antipathetic attitude between the profession and the body which regulates it would not be in the best interests of the public welfare. The way in which the regulations are formulated and enforced is as important in some respects as the actual intention of the regulations themselves. Therefore, although the ultimate accountability of a government department to the democratic processes may appear to have some advantage, it appears that this accountability must be avoided. Policy must be determined by experts; this objective cannot be achieved if the determination of the regulatory framework is subjected to public evaluation. The regulation of dentistry belongs to that large group or area of public concern which is best removed from the political arena.

Financing the College

It has been noted that one of the major stumbling blocks over which the RCDS falls in an attempt to live up to its statutory obligations is severe financial constraint. The proposal which we have advanced of setting up regional dental clinics would, of course, require substantial resources. As a part of a government department, the agency which sets up these clinics would have access to the necessary funds. As an agency independent of government, the source of adequate funds is a very real problem for the RCDS. The large amounts of money which may become necessary would have to come ultimately from a government agency or from a government department. This involves a difficulty in preserving the independence of the RCDS. Financial dependence often leads to other forms of dependence. There must be written into the statute provisions which will make it possible for the RCDS to apply to government for annual grants to carry out its responsibilities. The RCDS, however, must be subjected to a minimal amount of government interference in the determination of their use and allocation.

Since the largest proportion of funds required by the RCDS would be used for research, hospital, and educational purposes, and since the operation of the dental hospital could be differentiated from the educational aspects of the regional clinics, it may be necessary to apply to both the Department of Education and the Department of Health for funds. Currently in the United Kingdom, the dental hospitals in which most dentists receive their training are financed jointly by the Department of Health and the Department of Education (through the University Grants Commission). The experience has not been a completely happy one. The dental hospitals are run and operated as organic units and distinctions between which activities are related to the operation of the hospitals and which are related to the training of dentists and auxiliaries are sometimes forced. During interviews,

directors of some of the dental hospitals expressed the wish that the dual source of financing could be eliminated.

Although it is outside the scope of this study, it is helpful to examine the sources of financing for institutions that are engaged in the joint provision of educational and health facilities. It is evident to even the most casual observer that in the provision of trained personnel in the health field the Department of Health and the Department of Education have a joint responsibility and that the policies of one department can easily frustrate those of the other.

Take the popular notion that there is a growing shortage of dentists. The responsibility for this lies probably not with the Department of Health but with the Department of Education and perhaps the universities. The shortage of dentists, if it exists, is related directly to the shortage of training facilities for dental students. It certainly is not due to a shortage of willing candidates.[4]

The simple fact is that responsibility in these areas overlaps. Therefore, there should be only one agency for the RCDS to apply to for its financing. Furthermore, this body, in evaluating the application of the RCDS, should be as far removed from the political process as possible. Such an agency could be established by setting up a committee composed of members of the Department of Health and the Department of Education so that the RCDS might avoid applying directly to either department for funds. A preferable arrangement, however, would be for the College to apply directly to the Treasury. Since the problem of financing the RCDS must be worked out in a wider context than can be considered here, we shall not attempt to define the best method of financing; we shall leave it to those who deal with the wider context.

Conclusions

If the RCDS is to be equipped to meet the problems that should properly concern it in the coming decades, it will have to depend upon the government for financing; but this should be, as far as possible, the sole extent of the relationship between the RCDS and the government.

Since the RCDS operates and has its duties spelled out by a government statute, the government obviously has ultimate control over the RCDS. In suggesting that the RCDS should depend upon the government for financial aid only and should not tolerate government interference in its pursual of its objectives, we are suggesting that what policy guidance the RCDS receives should be given in the statute and formulated as a responsibility of the Board. This ensures and maximizes the College's freedom to pursue policy without consideration of political constraints.

The College's Relationship to Other Agencies in the Healing Arts

With the growing complexity of the healing arts the need for some coordination among those bodies engaged in the administration of various sectors is likely to

[4]B. A. McFarlane, *op. cit.*, p. 19.

increase. This need from the point of view of the dental profession is not urgent at the moment, but it is one that should be anticipated. Obviously, if considerable freedom is to be left to the individual professional organization, such as the RCDS, to administer the internal affairs of the profession and safeguard the public interest, it would be nonsensical to expose these bodies to outside control that would infringe on this freedom.

Again, of course, we confront a problem which is part of a wider issue — what type of structure should be erected for the "general" administration of the healing arts. Whatever general type of coordinating body is proposed, it should be designed so as not to diminish the sense of responsibility that the RCDS has for the welfare of the dental patient and the dentist. One fears that the bureaucratic mind, seeing that the RCDS is relatively independent of government control, will instinctively wish to subject it to some other controlling body. This would negate one of the principal purposes of creating the RCDS in the first place — the widespread belief that control of the profession can be achieved most effectively by making members of the profession responsible for its conduct and regulation. This whole principle is lost if some super-council appends some of the traditional responsibilities of the RCDS.

Except as a body which formally brings together those engaged in the control and regulation of the healing arts for the consideration of mutual problems and as a vehicle for launching a common assault on issues of joint interest, a super controlling body outside the government would serve no purpose. It would merely create confusion in the public mind, the professional mind and, likely, in the civil service mind as to where responsibility actually lies. Unless there is a desire to deliberately blur the lines of responsibility and to emasculate the vitality of the RCDS, every attempt should be made to avoid making the RCDS responsible to some body outside the government itself. If issues of such great importance arise that they cannot be dealt with satisfactorily by a coordinating body, the government can use its power to amend or alter the structure under which the controlling authority is constituted.

Conclusions

The RCDS must remain free from government control in its duties of regulating the profession. A super-council could not discharge these duties effectively, and if it attempted to take over some of them, would only hinder the RCDS.

Finances of the College

Even social investigators who are not excessively cynical feel that the true motives of the organization under study are often best revealed by a peek at the management of its financial affairs.

A look at the balance sheet of the RCDS is revealing.[5] It would make an admittedly cynical investigator wonder just what policies the RCDS is actively engaged in pursuing. The accumulated assets of the RCDS approximate half a million dollars; annual revenues exceed a quarter of a million dollars. This might appear to be sufficient financial backing for at least the modest pursual of the responsibilities which the RCDS is obliged to undertake — the safeguarding of the public interest and the regulation of the profession.

Approximately $40,000 is devoted to staffing the RCDS; a further $50,000 (which includes the honoraria to the members of the Board) is devoted to the operation of the RCDS offices. It would be extremely difficult to refine this breakdown of costs and assign them to functions actually performed. They are, however, costs which could in some sense be regarded as the overhead of the operation of the College. A further sum of slightly more than $20,000 is devoted to Board activities. This sum, together with the further disposition of the sizeable sum of $112,000 in grants, represents monies which are allocated to the pursuit of the Board's policies.

Surprisingly, only 10 per cent of the annual revenues are devoted directly to the activities of the Board. This, of course, means that financially, at any rate, the Board is not heavily committed to carrying out any particular program. Less than $5,000 is devoted to enforcing the Act, a remarkably small sum in view of the complex responsibilities that the Act places on the Board. Equally surprising and small is the commitment of funds to education or what may be viewed in the broader sense as the improvement of standards through the advancement of education — approximately $10,000, of which less than $5,000 is assigned to extramural lectures.

The direct grant to faculty research is a mere $1,000; funds for the provision of scholarships, less than $2,000.

The largest single expense is a grant of over $100,000 to the Canadian Dental Association. Although the relationship is inappropriate, the RCDS is the corporate member of the CDA, and as such it is obliged to make this grant; failure to do so would remove Ontario dentists from this voluntary association.

The "Dentists' Legal Protective Association" receives more ($3,000) than do all the direct grants made by the RCDS for research or education purposes.

Expenditures on Education and Research

Also suggestive in their own way are the historic trends of some of the budgeted items.[6] In 1946 total revenues amounted to $26,645; by 1956 they were a healthy

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[5]Unless otherwise indicated, all revenue and expenditure figures in this section have been taken from either the Auditor's Report or the Treasurer's Annual Report, and are for the year 1967.

[6]All figures relating to revenue and expenditures for 1946 to 1966 are taken from the Auditor's Reports and from the Treasurer's Annual Reports.

$120,767; and by 1966 they had reached a respectable $263,146. Over the twenty-year period 1946-1966, revenues showed a tenfold growth. During the same period, direct grants for dental research grew from $300 in 1946, to $500 in 1956, to the present unimpressive $1,000 in 1966. Expenditures on extramural lectures (the only direct expenditure by the RCDS which could be regarded as an attempt at a program of continuing education) grew from $1,063 in 1946, to $2,735 in 1956, to $5,217 in 1966. Thus, these two items have fallen from approximately 5 per cent of the total revenues to approximately 2½ per cent in 1966. These figures suggest what a more detailed discussion of the financial statements would confirm; that is, during the past twenty years the relative significance of research and education — at no time very substantial — has declined, and direct financial involvement in research and education by the RCDS has declined.

The Costs of Enforcing the Act

The costs of enforcing the Act were abnormally low during 1946 — a modest $288. In 1947, a more typical year for the period, they were $1,367; in 1948 they leapt to $3,066; and in 1949 fell back to $1,994. Thus, during the late 1940's the Board might have reasonably budgeted $2,000 for the enforcement of the Act. The actual budgeted item in 1966 was $5,000, but expenditures reached $6,129; in the previous year the actual expenditure had been $4,191. During the later 1940's the typical cost of enforcing the Act consumed between 4 per cent and 6 per cent of the RCDS revenues. In 1965 the cost in percentage terms had fallen to less than 2 per cent; in 1966 less than 2½ per cent.

The revenue side of the financial statements also contains an interesting comment upon the enforcing of the Act. During the four-year period 1946-1949 inclusive the average revenue from fines and penalties was roughly $500. The year 1965 appears to have been the year in which virtue triumphed; the collection of fines came to a mere $60. Virtue's hold was a tenuous one; in 1966 fines climbed to $810. Still, in view of the appreciable increase in both the population of the province and the number of dentists, it appears that even in 1966 virtue was winning her slow struggle against whatever it is she is struggling against. If these figures were adjusted to current dollars, there would be overwhelming evidence that the financial commitment of the RCDS to the enforcing of the Act has diminished and apparently that its effectiveness also has diminished — or that dentists and would-be-dentists are in actual fact more virtuous and less inclined to offend against the Dentistry Act. Perhaps a more tempered interpretation of the figures is that the RCDS is now less vigorous in its enforcement of the Act.

Support of the Canadian Dental Association

The major beneficiary of the growth of the RCDS revenues has been the Canadian Dental Association. The RCDS has the distinction of being the principal support of the CDA. In the twenty years during which RCDS revenues grew tenfold, the

contribution to the CDA grew thirteenfold. During both 1946 and 1956 the grant to the CDA represented approximately 30 per cent of the RCDS revenues, but by 1966 it consumed 40 per cent of the annual revenues.

Deficiencies of the College's Spending Practices

The entries in the financial statements also suggest another important aspect of the behaviour of the RCDS. One of the truly amazing things about an historical survey of the financial statements is the absence of "unusual" expenditures. Essentially, the categories of expenditure have not changed since 1946. As suggested above, there have been shifts in the relative significance of some items and from the point of view of this report most of these have been unfavourable. In no instance has the RCDS used its financial strength or power to promote a campaign or pursue a policy; to become significantly involved in a research program; to become an important source of student scholarships; to become a source of funds for the subsidization of dental services in rural or depressed areas; to become directly involved in issues of dental public health (it traditionally makes a grant to the Dental Public Health Committee of the Ontario Dental Association); to accumulate factual material on the state of the profession; or to finance research on the state of the profession or the actual standards of practice. Any active interest that the RCDS has in these matters, it apparently chooses to express in the form of grants to others.

In the twenty years, 1946-1966, the only expenditures other than those which are traditionally made were as follows: in 1952 and 1953, $1,576 and $816 for "publications"; in 1960, $1,769 for Mediscope and $479 for a brief on fluoridation; in 1961, $2,551 for Mediscope. Dynamic leadership in dentistry can scarcely be inferred from these figures.

Conclusions

Our conclusion from the examination of the financial statements of the RCDS is that it has been a traditionally conservative institution, not given to breaking new ground, and not particularly energetic in the pursuit of its *own* policies. Whatever the moral commitments of the RCDS have been, there is little evidence to suggest that they have been backed by the tangible commitment of cash.

The fact that the RCDS has not committed funds to the resolution of what we have termed the problems of the profession suggests either that it thinks these difficult problems can be solved through the perpetual meeting of committees, with no basic research being undertaken, or that it has no deep sense of responsibility for these problems.

During the testimony before the Committee on the Healing Arts the Board, of course, professed deep interest in these problems, but how it could pursue these interests and still tolerate the information vacuum puzzles the author. There has not been and is not now any financial provision for acquiring the basic data for

initiating fundamental research which may eventually lead to the resolution of these problems. Without belittling the considerable time that doubtless is spent in committees and the appearance of much hard work being done, it is not surprising that during the past twenty years in RCDS has not produced radical solutions to traditional problems. If these traditional problems are of concern to the RCDS, the benign belief that they will surrender to the intuition and instincts of well-meaning committees should have become obsolete long ago.

The enormous problems facing the RCDS call for the commitment of finances. One of the most important harbingers of reform within the RCDS would be an appreciable change in the pattern of expenditures. If this is not forthcoming spontaneously from the Board (whether or not reformed according to our suggestions), some general directions regarding the disposition of finances should be incorporated in the legislation.

Chapter 10 Proposals for the Revitalization of the Royal College of Dental Surgeons

Even the most inattentive reader of the foregoing critique of the RCDS should be aware that we have found cause for, if not dissatisfaction, then at least unrest. The College is seriously hampered in terms of its ability to carry out its statutory function — the defence of the public interest — and the versatility of the policies which it may pursue. The reasons for this are neither many nor varied; they all stem initially from the College's inability to become integrated into the industry for which it is responsible. There should be no grounds for illusion here. The College, through the corrosive power of time, has fallen victim to the enhanced position of the universities, inadequate financial resources, the penetrating expansion of the ubiquitous provincial government, a weak and undernourished voluntary association and, last and most important, a traditionally passive philosophy. Rather than becoming a strong pace-setting institution, the College has tended to become a conscience without muscle. It does not have adequate status or power to be a ruler over the profession; it has been reduced to the position of an adjudicator over some but not all aspects of the dental industry.

These may seem to be derogatory statements intended to demean the College. The fact is, however, that since its inception the position of the College has been demeaned by vicissitudes, many of which are beyond its control. There is, therefore, little purpose in becoming indignant; one cannot provoke history into debating itself. If there is a contentious point, it is how the College should be equipped to face contemporary reality. This is the problem that we shall attempt to solve in this chapter.

Financing and the Costs of Reform

In the brief historical sketch of the College it was suggested that one of the most important factors in driving the College to give up direct responsibility for education was financial. If there has been one single factor which has led to the deterioration of the control of the College, it has been its inability to call upon sufficient funds to meet the problems that have emerged throughout this century. We should emphasize, however, that previous Boards do not seem to have seen the significance of their financial constraint. The evidence for this lies in the fact that no previous Board has approached the provincial government for resources to carry out some of its responsibilities. Historically, the College and

costs of achieving more effective control can be analyzed we must be prepared the government seem to have assumed that statutory professional bodies should be self-financing.

This assumption might make some sense if the purpose of the College were to safeguard the professional interest; it does not make sense — indeed, it is completely untenable — when the expressed purpose of the College is to safeguard the public interest. It is asking too much that the members of the College impose high taxes on themselves to safeguard the public interest. We must ask whether, therefore, the Royal College of Dental Surgeons, and perhaps any other professional statutory body, *must* be self-financing.

The answer is that if there is conflict between the College's ability to be self-financing and the public interest, the provincial government must be prepared to underwrite part of the cost of the College. If the provincial government is not prepared to see that the College has adequate financial strength to implement its statutory powers, these statutory powers are a sham. In fact, they are a triple sham: the public, the members of the College, and the government will all be the victims of an illusion.

The only alternative to government subsidization of the College is for the government to set the annual licensing fee. The government would set the fee at a rate that would generate sufficient revenues for the purposes of the College and the Board would collect it. Unfortunately, this alternative has serious drawbacks. Members of the College would be quite likely to elect a Board which would attempt to minimize the College's responsibilities in order to reduce the revenues needed by the College and, therefore, reduce the annual fee. Something akin to the present situation probably would emerge.

It is difficult to escape the conclusion that the provincial government, through the Department of Health and/or the Department of Education, or through some special agency, will have to become involved in the financing of the College. This would represent a major break with tradition and could in itself hail a new era for the College. Of course, it would require greater accountability on the part of the College towards the government. But we shall discuss accountability later.

We have discussed finances at this point because the scheme we are about to propose for reforming the College will require more financial support than the members can be reasonably expected to provide.

It is our belief that any plan which will improve the role of the College in controlling the industry will cost money. These costs will fall ultimately on the taxpayer, the dental patient, and perhaps the dentist and his co-workers. The benefits that are to be derived from effective control must be carefully weighed against the costs that this control will incur. It is not possible at this time to make any precise comparison of the costs and benefits. Our proposals are advanced, however, on the assumption that the responsible authorities intend to give the College effective control over the industry and the profession. Until the

for the possibility that the current situation is an optimal one, and that the costs of eliminating the defects noted earlier are not warranted.

Reconstitution of the Board

The notion that the Board of the RCDS should become involved in the administration of public funds is a radical departure from tradition and from the conventional concept of a professional college. In Chapter 3 we discussed the desirability of reconstituting the composition of the Board and through legislation clarifying its activities. The proposals we shall advance in this chapter are premised only on the assumption that sweeping and fundamental changes can be brought about in the Board and in the activities of the College by changes in the composition of the Board. Indeed, it is hoped that the changes in the structure of the Board and the proposals that are to be advanced in this chapter would change the RCDS from a traditional professional college to something like a crown corporation responsible for the conduct of a government-sponsored enterprise. Obviously, the analogy with a crown corporation is strained, but this comparison is no more inappropriate than comparing the "new" RCDS to the traditional professional college. The reforms that we envisage are of such magnitude that we could appropriately think of the RCDS as a Dental Commission. In this form it would become an effective regulatory commission or agency.

The Professional College as a Regulatory Body

We have commented upon the peculiar status of the professional college. Under the statutes that created it, it is supposed to act in the public interest; but because of the manner in which its executive officers are selected and the mode of financing it has evolved into an institution that in most cases exists to protect the members of the profession. Often this evolution has been inimical to the public interest.

If one can for the moment ignore the oddities of history, it seems clear that the proper function of the professional college is that of regulatory agency. It is this concept above all others that we wish to emphasize. If the election of some Board members by the profession is inconsistent with or frustrates the activities of the Board as a regulatory agency, then the composition of the Board should be determined in some other way.

Having decided the RCDS should behave as a regulatory body, we must consider two further questions. First, what is the scope of the regulatory powers which the College (perhaps now we should begin calling it a Commission) should have? Second, how should the activities of the College or Dental Commission be coordinated with the regulatory activities of other bodies in the healing arts?

Scope of Regulatory Powers

Fortunately, neither question is particularly difficult. Dentistry, or more specifically the dental industry, is reasonably well demarcated. The regulatory body should

be concerned, and have the powers to support its concern, with the whole of the dental industry, not just the professional dentist. It is our view that all forms of dental personnel which come under some form of government regulation should come directly under the jurisdiction of the reformed RCDS or Dental Commission. This implies a reciprocal measure in that all forms of regulated personnel should have some sort of representation on the Commission. In practical terms, this means that the dental technicians as well as dental hygienists should come under the direct regulation of the Commission.

The scope of the Commission's regulatory activities should be expanded to include some control over the construction and supply of dental materials, dental equipment and dental appliances. The Commission then would become directly responsible for the regulation of the commercial dental laboratories.

Coordinating the Regulatory Powers

The second important question about the scope of the powers of the Commission and the exercise of these powers is how they should be coordinated with the regulatory activities of other bodies in the healing arts. We must recognize that there now exists in Ontario a body — the Council of Health — which has been created to act as the "senior" advisory body to the Minister of Health. The Council of Health is still in its evolutionary stage. It would be possible, therefore, to bring together under the umbrella of the Council, perhaps through a system of subcommittees, all the responsible regulatory agencies in the healing arts. The Council could act as a forum in which problems of coordination could be discussed and resolved. The resolution would have to be voluntary, however, since the Council currently does not have the power to impose its will upon any of the regulatory agencies, and there are cogent reasons why it should not be given such power.

The Council is eminently suited to investigate the problems of coordinating the various regulatory bodies in the healing arts. Its functions could be expanded to include making recommendations to the Minister of Health if problems of coordination cannot be satisfactorily resolved by the regulatory bodies themselves. Once a recommendation has been made to the Minister, the government must decide and perhaps legislate as to how jurisdictional problems between the regulatory bodies are to be resolved.

The representation of the Dental Commission on the committees of the Council of Health also would ensure that essential information was passed from the Dental Commission to the Council, and that relevant information was passed back to the Dental Commission. The necessary dependence of the regulatory bodies on the Council of Health (and thus on the Department of Health) may develop into a situation in which strong evolutionary forces would create a de facto centralized coordination of the activities of the regulatory bodies. In such a climate, however, the regulatory bodies would still be small enough to act

expediently and responsibly on the day-to-day demands of governing or regulating the profession or industry.

In this proposed scheme there is always the possibility that the Council of Health or some other coordinating body could supplant the reformed college in some or all of its powers and responsibilities.

Whether the regulatory framework suggested here is appropriate or the best of a wide range, depends upon the available alternatives. Only after an examination of the alternatives has the author settled upon the proposed regulatory structure, but it must be emphasized that the proposed framework is the one which seems most appropriate for the administration and regulation of the *dental* profession and *dental* industry. Specific consideration of other areas of the healing arts may well suggest that the general framework within which this study proposes to establish an agency for the regulation of dentistry would be inappropriate. Therefore, in what follows regarding general regulation, it should be understood that the argument attempts to establish only what appears to be optimal from the point of view of dentistry, and not necessarily from the point of view of the general regulation and coordination of all the healing arts. It is only by detailed examination of the problems in other areas of the healing arts that one could arrive at the best general regulatory framework for all health disciplines. (Such a detailed study could show whether dentistry is truly unique as we have assumed or whether it is typical of the problems and past policy pursued by the regulatory agencies and professional colleges.)

Review of the Problems

We have already established two sets of problems with which any regulatory framework must deal. There are the problems of specific regulation, which in the past and probably in the future will relate to the problems of education, licensing and discipline. We have argued that these three areas of regulation are, in fact, subsets of a unity that may be called the "regulation of the standard" or "the maintenance of standards of practice and service". Traditionally and by the statutes, these have been the areas of jurisdiction with which the colleges have been concerned, or should have been concerned. We have, however, found that for two distinct sets of reasons the responsibilities of the colleges have not been satisfactorily carried out.

The first set of reasons relates to the internal administration and representative nature of the board of the College. This set of reasons, like the problems of specific regulation, may be regarded as internal to the dental industry or dental profession. The second set of reasons relates to the inability of the College to coordinate effectively its activities and responsibilities with other agencies and authorities. The College has been unable to call upon a wide range of talents, resources and powers to solve problems that affect the quality of dental services and their provision but that are not matters of specific legislation. These are the

problems associated with manpower supply, geographic distribution, relations with other professions in the healing arts, the creation of university departments for the training of professionals and the creation of new forms of auxiliary personnel, the conduct of research, and so forth. The list could be much longer. The items on it are crucial to the provision of adequate dental care to the population and, further, they are not the problems of specific regulation.

These problems are external to the profession because they involve other parties or agencies such as the universities, government departments and other professional bodies.

The Administrative Alternatives

The Extremes

Against the background of this cataloguing of the problems facing dentistry, we may examine the range of administrative alternatives or regulatory frameworks that are open to us. At one extreme is the situation in which completely autonomous professional colleges have no direct responsibility to anyone save possibly the members of the profession. At the other extreme is the situation in which all regulatory responsibility is absorbed by the Department of Health. Neither is very appealing. The first does not provide a means of solving problems that are external to the profession and presents an irresistible opportunity to abuse statutory powers. The second would be able to deal effectively with the external problems of the profession, but would probably be far too cumbersome to deal satisfactorily with the day-to-day problems of specific regulation. Furthermore, this alternative would require a major revision of the traditions of government departments along lines that are certainly unacceptable. Specifically, it would require that a government department be placed in a position to impose penalties; it would have, therefore, judicial powers alien to the development of parliamentary government.

The College and a Coordinating Body

Between these two extremes there is an infinite range of possibilities, but the range narrows considerably if we assume that the details of specific regulation and discipline are placed in the hands of an agency which has these specific responsibilities, together with the requisite powers and immediate knowledge to carry them out. The range becomes narrower still if we assume that external problems are to be dealt with by an agency which has the requisite power, financial resources, knowledge and responsibility to carry out these duties. In short, we are assuming that there is merit in an administrative framework of the healing arts which is capable of recognizing and dealing with two distinct sets of administrative or regulatory problems. There is, however, a factor in all this which cannot be ignored: ultimately the government must assume final responsibility.

Indeed it is very difficult to see how the government can avoid responsibility for a great many decisions since, in the last resort, its fingers are wound around

the all-important purse strings. This fact makes the provincial government the de facto arbiter of the supply of domestically trained professionals in the healing arts. It can control not only the level of expenditure for the training of health personnel, but also the mix of the personnel to be trained. Its influence in this area will become even more pronounced if and when large numbers of auxiliaries of various sorts are trained in the community colleges. The level of manpower training and the mix of medical personnel have been the ultimate responsibility of the provincial government in the past and will, without a major revolution in the disbursement of public funds, continue to be so in the future. The time has long since passed when it is necessary for the public, the professions and the government to recognize that the professional colleges are not responsible for "restricted" manpower. Manpower is controlled by the provincial government's decisions regarding financing of university faculties for the training of personnel in the healing arts. Perhaps the explicit recognition of this fact will put an end to the naive arguments (borrowed mainly from the American situation[1]) that the profession exercises a monopoly over the training of students.

Problems and decisions which ultimately will involve reaching into the provincial purse must be left with the provincial government. Major decisions regarding the mix of medical personnel, major research efforts and the like, therefore, will continue to be a responsibility of the provincial government.

This raises some delicate questions about the position and the evolutionary course that is to be followed by the Council of Health. The Council doubtless can provide the Minister with a wide range of well-informed professional advice and a range of opinions and talents that would not normally be available to him. The danger is that the Council, by enlarging the bureaucratic structure, will diffuse responsibility and in turn diminish the Minister's and the Department of Health's sense of responsibility.

We have suggested that the Council of Health would be a suitable agency for the coordination of the regulatory bodies. If two regulatory bodies are unable to resolve their differences, or if the jurisdiction of regulatory bodies is ill defined, the Council would be in a unique position to recommend changes in the statutes to the Minister. This should not mean, however, that the regulatory agencies be responsible to the Council. The view here is that they should be responsible to the Minister.

The Super-Council

Rather than disperse the regulatory authority among a number of regulatory agencies, each responsible for a specific area of the healing arts, it would be possible to place all regulatory and administrative authority in the hands of a super-body such as the Council of Health and let the Council determine, through

[1]In some cases in the United States, professional colleges do exercise a monopoly for they are empowered to "accredit" an institution before it may train students.

a series of committees or subcouncils, the regulation of each profession. This would ensure centralized coordination of all regulatory activity. The cost of this centralized coordination is the very size and scope of the administrative agency. It would be a very powerful body. It would have an enormous range of problems and responsibilities. Whether these attributes would render it less or more successful as a watchdog of the public interest is a matter of judgement. Our view is that it would not. Nevertheless, if this type of administrative structure were selected for the governance of the healing arts, it would have to create a departmentalized internal structure to reflect the areas now covered by the professional colleges. Indeed, departments responsible for the administration of specific areas of the healing arts would not be significantly different from the professional colleges with somewhat reconstituted boards. The department concerned with dentistry could perform the functions and bring about the resolution of the problems we have identified by the means that are outlined below.

It must again be emphasized that the proposed reforms are to be seen in the context of an administrative structure for the healing arts that preserves the outlines of the present structure — that is, a structure in which the governance of the profession or industry is the responsibility of a largely independent body which has statutory obligations to the provincial government. Equally, it must be emphasized that these "largely" independent bodies must be reconstituted, at least in the case of the dental profession and the RCDS, so that the composition of the governing board will leave no doubt that anything other than the public interest is being served. This change in the structure of the traditional college is of such significance that we suggest the name of the regulatory body be changed to "Dental Commission". In any case, the change in the composition of the board, coupled with our proposals for the reform of the regulatory agency, would require a new distribution of responsibilities and activities among the regulatory agency, the Department of Health, and the University faculties of dentistry.

Reform of the Dental Industry

In their broadest outlines, the proposals in this chapter are intended to place the responsibility for the determination of manpower supply and the financing of the healing arts directly with the provincial government. The determination of university curricula, as may have been anticipated from Chapter 2, is to be left to the unfettered discretion of the university faculties of dentistry. The regulatory responsibilities are placed, hopefully more securely, in the hands of a reformed RCDS or a Dental Commission which must determine who is professionally qualified to practise as a dentist or an auxiliary, when a practitioner is guilty of a professional misdemeanour or of professional misconduct, and what the penalty shall be. This last implies that the new College or Commission must have staff and facilities to "police" and "rehabilitate".

The Problems

We may now turn to the specific cause arguing for reform: the particular deficiencies in the effective control exercised by the College.[2]

1) *Education.* The College lacks effective control over the content of the dental student's curriculum.
2) *Attitude of dental faculties.* The dental faculties are uneasy over the number of part-time faculty members and the amount of time that must be devoted to the teaching of digital skills and operatory procedures.
3) *Flexibility of dental training.* The only method of bringing dentists with foreign qualifications up to Ontario standards is to require them to follow all or part of the university dental curriculum. This is wasteful of time and apt to discourage immigrant dentists from seeking registration in Ontario.
4) *Corrective discipline.* The College lacks facilities to meet the challenge of technical incompetence among certain of its members.
5) *Geographic distribution.* The centralized training facilities for dentists in London and Toronto appear to have the effect of discouraging a wide dispersement of dentists, especially of specialists.
6) *Maintenance of standards.* The College lacks the means of ensuring that practising dentists maintain the standards required of them at graduation.
7) *Facilities for further training after graduation.* Dentists have little opportunity to acquire further training after graduation, except in universities. Courses in the university could require the dentist to be absent from his practice for a full academic year.
8) *Insular aspect of the practice of dentistry.* Unlike other professions in the healing arts, dentists are not sufficiently brought into contact with one another for professional purposes.
9) *Training of auxiliary personnel.* The training of auxiliary personnel must now take place within a university. This is an expensive setting for the type of training received, but presently appears to be necessary because these auxiliaries must be trained by qualified dentists and, in an educational setting, must work with dental students or dentists.
10) *Experimentation with new forms of auxiliary personnel.* The College, which has the primary responsibility for the creation of new personnel, does not have facilities for experimenting with new types of personnel.

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[2]See Chapter 7.

11) *Research.* Except through the facilities of the university, the College does not have the means of initiating new research, particularly on delivery systems.

12) *Lack of dental hospitals.* Although this could be remedied somewhat by the pressure to have hospitals establish dental departments, it appears to be a slow process and the minority position of the dentist in a medical establishment may be to the detriment of dentistry.

The Proposal: Dental Institutes

The list of "problems" could be longer, but the striking factor is that they have a common cause — the College's lack of physical facilities and finances. This may seem obvious, but it should be noted that at present there are no proposals to provide the College with any additional physical facilities or to create a physical setting in which some or all of these problems may be dealt with. The attitude of past Boards appears to have been that they are not in the business of running or operating any form of establishment.

It is obvious from the enumeration of these problems that many of them can be met only if physical facilities are available to the Board. Therefore, we suggest that the College be induced to create centres to house the personnel and equipment with which it might broach these problems.

The functions and activities of these centres must correspond to the problems that they are designed to meet. We shall advance one view of how these centres may operate, although other forms are possible. We shall call our proposed centres "dental institutes". The number, size and location of the institutes would ultimately depend upon the programs which they are intended to carry out. There are very persuasive reasons, however, for arguing that more than one should be established, and that no institute should be located in a city in which a dental faculty already exists.

Distribution of Dentists

As noted in item 5 above, one of the problems of dentistry within the province is the geographic distribution of dentists. Three factors have considerable significance in determining where a dentist will choose to establish his practice. The first is where he lived before he decided to become a dental student — a much higher proportion of students with a rural background eventually practise in rural communities than those with an urban background. The second is where the dentist finds himself upon graduation — there is a tendency for the new dentist to remain in the area or the community in which he received his training. By the time of his graduation, he will have spent several years in the community and will have acquired friends, perhaps a family, and possibly property in the community. Third, he will be influenced by the opportunity to do some dental

teaching. Even if he does not wish to teach, he may wish to remain in a community which possesses dental faculty members and, consequently, may be more professionally stimulating.

Locating the institutes in cities which do not have dental faculties would provide additional areas for those who found the third reason important. They could settle elsewhere than London and Toronto and still have the opportunity to do some dental teaching or be near the stimulation of a highly qualified group of dentists. Since these centres would have to be located where there was an adequate patient pool for their purposes, these centres would probably have more significance for the distribution of specialists than for ordinary practitioners.

Later we shall propose that these institutes be used to complete a stage of the dental student's training. If upon graduation the student were required to spend some time at the institute, he would have to leave the city in which he graduated. It is possible that this would give him an attachment, however slight, to another area and weaken his attachment to the city. If the institute were located in the same city as a dental faculty, the student would not have to break his connection with that city. How strong this force would be would depend partly on how long the student remained a member of the institute.

Internship after University

Now we turn to the question of why he should go to the institute in the first place. As shown in Chapter 8 the College does not have effective control over the dental curriculum; the choice of curriculum content is in the hands of the university. Also, the existence of more than one dental faculty creates a problem of the comparability of graduates from different faculties. It was pointed out also that reviving the licentiate examinations would not solve these problems. We concluded at that stage that the College must become actively engaged in the educational process. We noted also that an increasing number of dental graduates are choosing to spend their first year after graduation as associates rather than setting up their own practices. The reason for this appears to be not financial, but rather a sense of unpreparedness on the part of the graduate.

In view of these problems which are intractable under the present institutional framework, we suggest that one of the paramount functions of the dental institutes be the further training of dental students. The institutes would provide the setting in which the dental student could serve his "internship". The question of the length of time that a student should be required to spend at the institute is a matter for professional dentists and dental educators to decide. It should be noted, however, that the nature of the training and its duration would depend upon the response of the university. The existence of the institutes may make it possible for the universities to shorten the curriculum for the Doctor of Dentistry degree.

In item 2 above, and elsewhere, we have noted that some faculty members deplore the amount of time that must be devoted to digital skills and operatory

procedure. These matters, and the teaching of diagnosis, could be assumed by the institutes. This would permit the universities to concentrate more on the "academic" aspects of dentistry. Properly approached, the co-existence of the university dental faculties and the institutes could lead to a division of labour between the two, which the College, the universities and the dental student may find more satisfactory than the present arrangement. The universities could reduce the number of part-time faculty, and possibly the length of the academic program.

Training Foreign Dentists

The third problem area noted above was the admittance of dentists with foreign qualifications into the profession in Ontario. The only path to a licence for many of these dentists is to register as an undergraduate in one of the dental faculties. This is an inadequate arrangement, if for no other reason than the inability of the schools to adapt the undergraduate curriculum to the needs of these dentists. It is generally argued that while they have a strong medical background, their digital ability and craftsmanship simply are not comparable to those of an Ontario graduate. Furthermore, they are unfamiliar with advanced North American techniques. If this is true, some avenue other than the undergraduate degree should be provided by which these deficiencies may be remedied. The institutes we propose would concentrate on these aspects of dentistry, and since they need not be geared to the academic year, they could be much more flexible in accommodating these cases. Also, the time spent at the institute could vary with the individual case. The efficacy of the proposal with respect to the training of foreign dentists will become clear during the discussion of foreign qualifications.

Corrective Discipline

The fourth problem area noted above related to the problem of corrective discipline in cases of technical incompetence. We concluded in our earlier arguments that too little effort is being made to discover cases of technical incompetence, but that if cases of technical incompetence are discovered, the College is not in a position to prescribe an appropriate cure. Knowledge of this may create a disincentive to seek these cases out.

The institutes could be used to retrain practising dentists who have permitted themselves, for one reason or another, to practise substandard dentistry. All the necessary facilities for the preliminary examination of those suspected of substandard dentistry and for the retraining of these cases would be available to the College in the institutes.

In the institute the dentist required to take retraining measures would not be humiliated by having to return to an undergraduate atmosphere. He would not be subject to the undergraduate's round of lectures, laboratory hours and clinical training. He might still be able to carry on part of his practice (depending on the nature of his offence) while re-equipping himself to meet the standards set

by the College. The most striking advantage of an institute is the flexibility that it could achieve in dealing with individual cases of this nature.

Postgraduate and Refresher Courses

If we turn back to our enumeration of the "problem areas", items 6 and 7 merge well with the preceding discussion. Item 7 notes the lack of any extended program, other than the university, for a practising dentist to revive old skills or learn new ones. In some other countries, notably the United Kingdom, there is a continuous offering of courses, varying in length from a few days to three or four months, which permit practising dentists to continue their education. Ontario has nothing comparable. Clearly, the type of institute which we are describing would be ideally suited for sponsoring this type of program. Courses could be arranged so that dentists need not leave their practices for long periods of time. This would eliminate one of the major disincentives to seeking further training. Most Ontario dentists desiring further training must either do post-graduate work in one of the dental faculties, or leave the country in search of the desired course. This situation should not be permitted to exist.

Item 6 refers to our earlier conclusion that, to maintain standards among practising dentists, all dentists at various times in their careers should return to a teaching establishment for a short period. This would eliminate the need for attempting to identify incompetence by the use of inspectors, random after-treatment patient examinations, or special examinations. These retraining sessions could be used to bring practising dentists up to date with advances in technology, and to restore any skills that may have deteriorated. The typical dentist, depending upon his retirement date, might attend three or four such sessions after graduation.

A coherent picture of the institutes should now be emerging. They would provide facilities for advanced training for five different but not necessarily distinct groups. The first and probably largest group would be recently graduated dentists serving their "internship"; the second, the foreign dentist fulfilling the additional requirements to meet the standards of the College; the third group, and hopefully the smallest, would be those compelled to take retraining for reasons of technical incompetence; the fourth would be those voluntarily taking "refresher courses" or seeking specialized advanced training; and the fifth group would be the mandatory groups taking their periodic "refresher courses". At this point a variation on an earlier theme suggests itself. Those dentists who voluntarily seek further training in the institutes, or teach or participate in the activities of the institutes, could be made exempt from the periodic refresher courses.

Contact with Other Dentists

The existence of these institutes and the nature of their program would provide relief from the eighth problem — the insular aspect of the practice of dentistry.

The program of the institutes would bring dentists into contact with one another in a sophisticated professional atmosphere. Beyond this, however, the institutes could provide another important service. The practising dentist confronted with an unusual and particularly difficult case could bring his professional problem to the institute. Here he could ask for and expect to receive the advice and help of the specialists in the institute. The members of the institute would serve a function similar to that of the "Consultants" in the United Kingdom.

So far, the prime activity of the institutes appears to be some form of teaching for dentists in various stages of their career. There is no reason to confine the teaching functions of the institutes to dentists. Although we shall discuss in detail later the role of the dental hygienist in the provision of dental services, we shall anticipate the conclusions of that discussion here.

Training of Auxiliaries

The duties that hygienists are entitled to perform under the restriction of the present legislation do not require very high skill levels. In fact, the training that these girls now receive in two years in a diploma course is compressed into a period of weeks in the Armed Forces. Of course it will be argued that the hygienist is taught much more than her counterpart in the Canadian Dental Corps, but just what this additional training does to enhance the skills she provides is questionable. The conclusion forced upon us is that a university dental faculty is far too luxurious and expensive a setting for the training of this type of personnel. The length of the training period appears, if anything, rather excessive. The serious consideration being given to lengthening the training period is unjustifiable.

In view of the legislative limitations on the hygienist's functions, we believe that she could receive an adequate, and perhaps superior, training in the type of institute that we are proposing. These institutes, being more widely dispersed than dental faculties, would attract girls from a wider area; there would be less need for them to leave home to be trained. If an institute is not to be located in Toronto, the Faculty of Dentistry of the University of Toronto should continue to train hygienists. Otherwise, the largest source of supply in the province will be lost.

In conjunction with the training of hygienists, the training of another type of dental personnel — the dental technician — should be considered. Presently, there is only one formal institution for the training of dental technicians and it has a limited capacity. Most of those who qualify as dental technicians are recruited from continental Europe or follow a system of apprenticeship in this country. There is evidence that these sources are not geared to produce an adequate number of technicians. There is also reason to believe that the skill levels are rising and the need for close quality control is increasing rapidly. Of all the areas of dentistry that directly affect the patient, the most striking progress

has been made in the field of materials for appliances. In choosing the type of appliance and the material for it, dentists have a considerably wider field of choice than existed even a few years ago. If the practising dentist is to have the advantages of these advances in technology at his disposal, we must ensure that properly trained technicians are available.

A setting where considerable emphasis is to be given to the problems of practical dentistry is a suitable place for training this type of personnel. The skill requirements appear to be at least comparable to those of hygienists and are, in fact, probably higher.

The training of auxiliary personnel within the dental institutes poses some problems. Currently, the hygienist takes part of her training outside the dental faculty. If this aspect of her training is to be continued, the institutes must be located in towns or cities with either a university or a community college. This is not a very restricting condition on the establishment of the institutes; a quick glance at a map of Ontario shows there are few centres of any size without a community college or university. Under these circumstances, the non-dental aspects of the hygienist's training could be continued without diluting the institutes' concentration on the practice of dentistry.

Taking the hygienists out of the dental faculties would have several advantages. It would release valuable space for increased enrolments of dental students, for research facilities, and for postgraduate students. In fact, it would be a great boon both to the universities and the profession if the space now committed to the training of hygienists could be turned over to research and postgraduate training. Taking the hygienist out of the universities would permit the faculties to concentrate on more sophisticated aspects of dentistry and would release teaching time for other purposes. The training of the hygienist would not suffer. In fact, it would probably be much the same. She presently receives much of her training from part-time teachers. In the institute with its emphasis on practical dentistry, the participation of part-time dentists is a strong likelihood.

Since the institutes would be operated by the College, the College could design the curriculum of auxiliary personnel to conform with its own requirements. There are undoubtedly pressures within the university opposed to the teaching of technical skills and, therefore, the auxiliaries' curriculum may be diluted with courses which do not contribute to their professional development. The direct control of the College over the auxiliaries' curriculum would permit the College to experiment with the evolution of new types of auxiliary personnel. The admission procedures, the structure of the academic year, and the inflexibility of university budgets do not permit this type of experimentation. The machinery of the modern university is simply not suited for experimentation in the training or developing of new types of technical personnel. Because it would be concerned primarily with the development of standards within the dental profession, because it would be smaller, and because it would be a concentration of like-minded

professionals, the institute would have an enviable advantage in implementing the policy of the College with respect to auxiliary personnel.

Research

Given the concentration of highly qualified personnel within the institute and the orientation of the institutes towards problems of the profession, they could become the home and focus of dental research. Almost all observers of the dental profession in Canada deplore the lack of research funds and facilities. While it is to be hoped that greater research funds will be made available to the universities for dental research, a dramatic increase in research funds does not seem likely. In any case, there still would be considerable room for the institutes to engage in useful productive research. Dr. K. J. Paynter, in his report for the Royal Commission on Health Services,[3] made three separate points regarding research which seem highly relevant here. First, he noted the relationship between a high quality educational program and active research. The two go hand in hand and it is naive to suppose that one can achieve the former without the latter. Second, he noted the dearth of research funds and trained or qualified research personnel. Third, he pointed out that the bulk of research in the universities concentrated on fundamental research. "Clinical research," he suggests, "has been sadly neglected." He believes that this is where the major research emphasis should be placed. If we accept his points, and it seems impossible to dispute them, we may then look to the institutes to undertake extensive clinical research. Clinical research would meld well with other purposes and functions of the institutes. Paynter's attitude towards clinical research also suggests that clinical research falls within the general responsibilities that are charged to the College:

> Dental treatment will be with us for a long time, however, and the problems of the clinic can no more be solved by rule of thumb and empiricism than can any other problem. The clinician should be concerning himself not only with the development of better methods of treatment for the individual patient, but also with providing a more widespread and better dental service to the population as a whole.[4]

Concern with high standards, which is the proper concern of the College, must include concern with clinical research and its application. Observers of the progress of medical science note a growing gap between the achievements of basic research and their application by the practising physician. In looking forward to the time when basic research in dentistry has appropriate financing, we must provide the clinical research facilities and personnel to translate fundamental research into clinical procedures for the benefit of the patient. The institute, once given a responsibility for retraining of practising dentists, becomes a logical link between the basic research of the universities and the practising dentist. Without this link, we must expect a long time lag between fundamental advances and

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[3]K. J. Paynter, *op. cit.*

[4]*Ibid.*

current practices. This time lag lowers the social advantages of fundamental research and increases the current costs of combating dental disease and its prevention. Active programs of clinical research would be of great social advantage and they would transform the institutes into more than mere training schools. This would enable them to attract a much higher calibre of personnel.

Dental Hospitals

We have now argued that the existence of dental institutes would provide a mechanism to deal with the first eleven problems. The remaining one is the lack of dental hospitals, and again we shall argue that the institutes would provide a happy answer to this problem.

Although the medical and the dental profession attempt to maintain a harmonious relationship, this relationship does suffer from strain. The fault, if fault is to be found, appears to lie more with the medical profession than with the dental profession. The medical profession seems to be unwilling to grant equal status to the dentist. The development of dental departments in hospitals is slow and inadequate, and as it progresses the strain will become more pronounced. The Commission on the Survey of Dentistry in the United States notes with misgiving:

> As more hospitals have established dental services, characteristic problems have appeared. These include the administrative status of the dental service, the qualification of dentists for appointment to hospital staff, the scope of oral surgery procedure and the methods of admitting and discharging patients.[5]

This list of grievances could be longer and more detailed, but the grievances are extremely difficult to document because members of the profession in official capacities will not admit the conflict of interest. During his testimony to the Committee on the Healing Arts, Dean Dunn confessed

> We have a gray area of service in which academic and legal competences of both professions come together and you have essentially identified it in those areas which are oral-physical in character, and we have to be very frank with you, an area of some concern with the provincial statutes right now.[6]

From a reading of the transcript of the hearings, it appears that Dr. Dunn showed little willingness to elaborate either upon the "gray area" or what happens when the two professions come together. The attitude of the dentists has been that any potential conflict could be worked out between the professions, and for this reason they may have felt it unnecessary to make the issue a subject of public concern. The attitude of the medical profession is somewhat less restrained. In a subsequent round of hearings before the Committee, the medical profession

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[5]B. S. Hollingshead, *op. cit.*

[6]Committee on the Healing Arts, *Proceedings, op. cit.*

forcibly brought the issue into the open. They requested that the Committee consider recommending that the dentists in hospitals be placed under the supervision of the Chief Surgeon. In fact, the Ontario Medical Association has disputed the autonomy of the dentistry profession. The RCDS, long proud of its autonomy, immediately rejected the position of the OMA.

This public exchange between two of the most prestigious bodies in the health field in Ontario must be taken as a sign of the times and as a portent of the future. As dentistry becomes more sophisticated, the sensitivity of the medical profession to what it regards as an invasion of its traditional prerogatives will increase. The statutes which have been enacted to protect the public have instead become the articles defining the jurisdictions of different branches of the healing arts. We may reasonably expect that the rush to place as many medical services as possible under the roof of the general hospital will do little to mitigate the intensity of these jurisdictional disputes.

These disputes, by their very nature, focus on attempts to define the limits or boundaries of each profession. If the erection of such limits does nothing more than inhibit the exploration of new techniques, they must be judged inimical to the public interest. Without being unduly cynical, we may expect that a more intense rivalry between the professions could lead to the ridiculous types of jurisdictional disputes that arise in the building trades, as for example, between carpenters and electricians.

To avoid the emergence of the ridiculous, it will be necessary and desirable to keep the demarcation lines between the two professions vague and to encourage a sense of autonomy among the dentists. This may best be accomplished if there exists some institution in which the dentist is free from the scrutiny of the physician and where the whole responsibility for the oral health of the patient rests upon the dental profession. The modern multi-department general hospital is not a suitable institution. The function and organizational structure of the general hospital, and the preponderance of physicians in it all point to a minor role for the dentist in the modern hospital. In such a role the autonomy of the profession would be whittled away. To argue otherwise would be to presume a major change in the attitude of the medical profession, and this does not seem plausible.

We envision the dental hospital as equivalent to the dental department in a general hospital, but functioning independently. In our view the appropriate place for such department is in the dental institutes. The existence of a dental hospital within the dental institute obviously would compliment the teaching and research functions of the institute.

Somewhat less obvious, perhaps, is the effect of the dental hospitals in breaking down the traditional isolation of the solo dentist. In this respect, the significant effects would depend upon the number of dental institutes and the methods by which hospital rights were granted. One could speculate at great

length on the evolution of the dental hospital but this is not the place for detailed speculation. If it is seen fit to create dental hospitals, in conjunction with the dental institutes, then suitable guiding legislation should be incorporated into the Dentistry Act and the operation of the hospitals should be left to the RCDS.

The dental institutes which we are proposing have something of a counterpart in the British dental hospitals. There is, however, one major difference between the two. The British dental hospitals, both physically and in terms of their organizational structure, are closely tied to the medical departments of the British universities. The exception to this is the Eastman Dental Hospital, which is independent of any university. Under its roof the complementary and ultimately inseparable activities of treatment, teaching and clinical research are carried out. For those who are hesitant or afraid to build from scratch, the Eastman may provide a model for the proposed Ontario dental institutes. In our view, it cannot provide more than a rough model because the proposed institutes are more diverse in purpose and function.

Disadvantages of Dental Institutes

So far, we have concentrated on the advantages of the proposed institutes. To give our argument the appearance of a balanced and reasoned proposal, it would be convenient to find some convincing disadvantages. These, however, are hard to find. There is, of course, the expense that the implementation of the proposal would entail. Before any estimate could be made of this, several basic questions would have to be answered:

1) Would the internship at the institutes replace a year of university training? If so, it is possible that this aspect of the scheme would not represent an additional cost. It is even conceivable that it could be less expensive to society than keeping the dental student in university for that year.

2) Would the retaining schemes for practising dentists be provided free, or would the dentist be required to pay a fee; if he is required to pay a fee, what proportion of the expense would this cover? Our view is that the individual dentist should be required to pay a substantial proportion of the cost of his retaining program. Society provides him with a licence that protects him from competition; the retraining programs would be conditions for the retention of his licence. Therefore, it seems inequitable that society bear all of the cost of providing the preconditions for licensing.

3) Would the cost of research be an additional cost to society? Increases in research budgets would represent an additional cost to society (although it may eventually lower the cost of dental care). As pointed out earlier, most observers of dentistry in Ontario have deplored the paucity of funds for dental research. Whether or

not the institutes ever become a focus for research in dentistry, it is to be hoped that more money will be put into dental research. The costs of financing an appropriate level of research should not be charged, therefore, to the dental institutes unless it can be demonstrated that research becomes more expensive under these conditions.

4) Would the operation of the dental hospitals represent an additional cost to society? The answer to this question depends upon a number of factors. In a few years some form of denticare may be operating. If not, would the individual patients have to pay for the full costs involved in their treatment?

These four simple questions do not bring us very close to estimating the financial disadvantages of our proposal, but they do serve to suggest that there are very wide limits within which support would have to be drawn from society at large. Our view is that the dental institutes — with the exception of research and as far as is compatible with our notions of justice and social equity — should be as self-sufficient as possible. There is no doubt, however, that the institutes could not be entirely self-sufficient; they would have to draw on public funds. In the view of many, this would be a disadvantage and perhaps it should be recognized as such. We feel that such a scheme could be operated with a minimal dependence on public funds. Furthermore, in view of what the proposal may be capable of realizing, the recourse to public funds may not be a serious disadvantage.

A more serious drawback to the proposal is that it would disperse, geographically and perhaps in other respects, the resources available to the dental profession. We have argued already that there would be some very marked advantages to this, but in the case of research there may be some considerable disadvantages. Given a research budget of a particular size, the more institutions among which it must be divided, the smaller the individual budget will be. What is true of a general research budget is also true of appropriately trained research and teaching personnel. How much weight should be attached to this disadvantage is difficult to assess. In the end, it probably depends partly on the significance attached to the benefits that we have argued would also stem from this dispersion.

These seem to be the disadvantages of the proposal. There are, of course, a number of problems which would require serious consideration. A problem, unlike a disadvantage, is something that eventually can be overcome. There are the problems of the location of the institutes, the length of term of the internships and the duration of the retraining programs, recruiting personnel, paying or perhaps charging a fee for internship, payment for services rendered in the course of research programs, the training of internes, and services to be rendered in the dental hospital.

If there is a virtue in compiling long lists, here is an opportunity for extreme virtue because this list could be very long. The length, however, is not important.

The only important question is whether any of these issues and others that can readily be added to the list are insoluble within the general limits of the proposal outlined here. Although some of these problems are difficult and others unpleasant, none is insoluble. Indeed, in the face of a little determination and adequate financial support, these problems would melt away. The principal difficulty in implementing this proposal would be finding members of the profession with enough vision and determination. Indeed, any reform unless forced upon the profession through changes in legislation, will come only through the activity of the more far-sighted and determined members of the profession. The question which we are now naturally led to ask is whether the profession is organized in such a way that these people shall be in a position to effect changes to contend with changing circumstances. Perhaps there is even a prior question, and that is whether the organization of the profession does not blind the profession to the need for some reform.

Appendix IV

Results of 1966 Survey of Dental Practice in Ontario

TABLE A6

Percentage Distribution of All Dentists and of Dentists Participating in the 1966 Survey of Dental Practice

(a) By County

County	Number of participating dentists	Percentage of total participating dentists
Algoma	14	1.3
Brant	7	.6
Bruce	4	.4
Carleton	72	6.5
Cochrane	7	.6
Dufferin	3	.3
Dundas	1	.1
Durham	4	.4
Elgin	14	1.3
Essex	29	2.6
Frontenac	16	1.4
Glengarry	1	.1
Grenville	1	.1
Grey	7	.6
Haldimand	1	.1
Haliburton	—	—
Halton	32	2.9
Hastings	11	.9
Huron	4	.4
Kenora	3	.3
Kent	14	1.2
Lambton	11	.9
Lanark	3	.3
Leeds	3	.3
Lennox and Addington	1	.1
Lincoln	24	2.1
Manitoulin	—	—
Middlesex	46	4.1
Muskoka	3	.3
Nipissing	10	.9
Norfolk	8	.7
Northumberland	5	.4
Ontario	23	2.0
Oxford	13	1.1
Parry Sound	5	.4
Peel	22	1.9

TABLE A6 (Continued)

Percentage Distribution of All Dentists and of Dentists Participating in the 1966 Survey of Dental Practice

(a) By County (*continued*)

County	Number of participating dentists	Percentage of total participating dentists
Perth	6	.5
Peterborough	15	1.3
Prescott	2	.1
Prince Edward	1	.1
Rainy River	1	.1
Renfrew	13	1.1
Russell	1	.1
Simcoe	21	1.9
Stormont	6	.5
Sudbury	21	1.9
Thunder Bay	22	1.9
Timiskaming	6	.5
Victoria	3	.2
Waterloo	44	3.9
Welland	24	2.1
Wellington	13	1.1
Wentworth	60	5.4
York	395	35.8

(b) By City Size

City size	Number of participating dentists	Percentage of total participating dentists
Under 1,000	5	0.5
1,000 – 2,499	25	2.3
2,500 – 4,999	55	5.0
5,000 – 9,999	62	5.6
10,000 – 14,999	41	3.7
15,000 – 24,999	61	5.5
25,000 – 29,999	11	1.0
30,000 – 49,999	80	7.3
50,000 – 99,999	175	15.9
100,000 – 249,999	90	8.2
250,000 – 499,999	116	10.5
500,000 and over	378	34.3
Not stated	2	—
Total	1,101	100.0

TABLE A6 (Continued)

Percentage Distribution of All Dentists and of Dentists Participating in the 1966 Survey of Dental Practice

(c) By age

Age	Number of participating dentists	Percentage of total participating dentists
Under 25	21	1.9
25 – 29	160	14.5
30 – 34	182	16.5
35 – 39	157	14.3
40 – 44	173	15.8
45 – 49	128	11.6
50 – 54	64	5.8
55 – 59	49	4.5
60 – 64	52	4.7
65 – 69	64	5.8
70 – 74	32	2.9
75 and over	7	.6
Not stated	12	1.1
Total	1,101	100.0

(d) By Year of Graduation

Year of graduation	Number of participating dentists	Percentage of total participating dentists
1960 to present	301	27.3
1950 – 1959	412	37.4
1940 – 1949	142	12.9
1930 – 1939	89	8.1
1920 – 1929	113	10.3
1910 – 1919	18	1.6
1900 – 1909	1	0.1
Unknown	25	2.3
Total	1,101	100.0

TABLE A7

Gross Income, Expenses, and Net Income from Private Practice

(a) By County

County	Number of questionnaires returned	Number replied	Number not replied	Percentage of dentists in sample responding	Gross income per dentist	Expenses per dentist	Expenses: gross income ratio	Net income per dentist
Algoma	14	14	—	1.40	32,780.3	14,003.4	42.72	18,770
Brant	7	6	1	.60	27,126.5	9,892.2	36.47	17,230
Bruce	4	4	—	.40	25,128.0	10,490.8	41.75	14,630
Carleton	72	67	5	6.67	41,602.9	18,232.5	43.83	23,370
Cochrane	7	7	—	.70	33,216.1	14,185.9	42.71	19,030
Dufferin	3	3	—	.30	22,531.7	9,275.0	41.16	13,250
Durham	4	4	—	.40	28,700.0	14,689.3	51.18	14,010
Elgin	14	12	2	1.20	26,281.6	10,360.5	39.42	15,920
Essex	29	25	4	2.49	37,550.1	14,792.6	39.39	22,750
Frontenac	16	14	2	1.39	32,883.1	14,478.6	44.03	18,400
Grey	7	7	—	.70	26,086.7	10,703.9	41.03	15,380
Halton	32	31	1	3.08	34,379.5	15,355.1	44.66	19,020
Hastings	11	10	1	1.00	44,091.3	22,690.3	51.46	21,400
Huron	4	3	1	.30	26,749.3	10,424.0	38.97	16,320
Kenora	3	3	—	.30	26,910.3	12,058.0	44.81	14,850
Kent	14	13	1	1.29	30,141.6	12,235.3	40.59	17,908
Lambton	11	10	1	.10	38,718.2	18,104.3	46.76	20,610
Lanark	3	3	—	.30	25,646.0	13,786.7	53.76	11,859
Leeds	3	3	—	.30	38,806.7	17,993.0	46.37	20,810
Lincoln	24	21	3	2.09	41,146.7	18,121.6	44.04	23,025
Manitoulin	—	—	—	—	—	—	—	—
Middlesex	46	43	3	4.28	35,268.7	16,411.5	46.53	18,850

TABLE A7 (Continued)

Gross Income, Expenses, and Net Income from Private Practice

(a) By County *(continued)*

County	Number of questionnaires returned	Number replied	Number not replied	Percentage of dentists in sample responding	Gross income per dentist	Expenses per dentist	Expenses: gross income ratio	Net income per dentist
Muskoka	3	3	—	.30	24,228.7	9,828.0	40.56	14,400.0
Nipissing	10	10	—	1.00	35,146.6	16,585.5	47.19	18,561.0
Norfolk	8	8	—	.80	29,405.0	12,052.5	40.99	17,352.0
Northumberland	5	5	—	.50	45,315.4	19,130.4	42.22	26,185.0
Ontario	23	21	2	2.09	44,568.6	20,850.2	46.78	23,718.4
Oxford	13	13	—	1.29	32,271.6	14,133.2	43.79	18,138.4
Parry Sound	5	5	—	.50	21,611.0	8,795.4	40.70	12,815.6
Peel	22	21	1	2.09	34,402.2	17,546.8	51.00	16,855.5
Perth	6	6	—	.60	25,945.7	12,455.2	48.00	13,490.5
Peterborough	15	15	—	1.50	28,825.3	12,803.7	44.42	16,021.5
Renfrew	13	13	—	1.29	28,262.0	11,894.3	42.09	16,367.7
Simcoe	21	20	1	2.00	35,795.3	15,724.0	43.93	20,071.3
Stormont	6	6	—	.60	43,001.2	22,028.2	51.23	20,973.0
Sudbury	21	19	2	1.89	41,771.7	18,690.1	44.74	23,081.6
Thunder Bay	22	22	—	2.19	35,388.4	17,223.3	48.67	18,165.1
Timiskaming	6	6	—	.60	33,326.8	13,776.8	41.34	19,550.0
Victoria	3	3	—	.30	26,052.0	12,052.0	46.26	14,000.0
Waterloo	44	42	2	4.18	37,952.0	16,642.5	43.85	21,309.5
Welland	24	24	—	2.39	38,170.0	17,448.8	45.71	20,721.2
Wellington	13	13	—	1.29	36,073.8	17,184.5	47.64	18,889.8
Wentworth	60	54	6	5.37	37,024.6	16,754.8	45.25	20,269.9
York	395	364	31	36.22	35,819.6	17,119.2	47.79	18,700.4

TABLE A7 (Continued)

Gross Income, Expenses, and Net Income from Private Practice

(b) By City Size

City size	Number of questionnaires returned	Number replied	Number not replied	Percentage of dentists in sample responding	Gross income per dentist	Expenses per dentist	Expenses: gross income ratio	Net income per dentist
Under 1,000	5	5	0	.49	18,900.2	7,986.0	42.25	10,914.2
1,000 – 2,499	25	21	4	2.05	26,644.1	11,903.1	44.67	14,741.0
2,500 – 4,999	55	53	2	5.18	32,200.6	13,375.0	41.54	18,825.6
5,000 – 9,999	62	60	2	5.87	30,566.9	14,103.9	46.14	16,463.0
10,000 – 14,999	41	39	2	3.81	36,960.5	17,013.2	46.03	19,947.2
15,000 – 24,999	61	60	1	5.87	30,166.6	12,994.8	43.08	17,171.8
25,000 – 29,999	11	11	0	1.08	41,165.3	18,222.3	44.27	22,943.0
30,000 – 49,999	80	78	2	7.62	37,347.9	17,455.3	46.74	19,892.6
50,000 – 99,999	175	162	13	15.84	37,183.5	17,039.1	45.82	20,144.4
100,000 – 249,999	90	83	7	8.11	38,025.7	16,790.7	44.16	21,235.6
250,000 – 499,999	116	107	9	10.46	40,023.5	18,023.2	45.03	22,000.8
500,000 and over	378	344	34	33.63	36,135.8	17,244.8	47.72	18,891.0

(c) By Age

Under 25	46	34	12	3.35	21,208.1	10,483.9	49.43	10,724.0
25 – 29	135	122	13	12.03	31,867.5	16,388.4	51.43	15,479.0
30 – 34	182	171	11	16.86	37,316.6	17,388.0	46.60	19,928.4
35 – 39	157	155	2	15.29	41,610.8	18,710.9	44.97	22,900.0
40 – 44	173	162	11	15.98	42,617.1	19,229.4	45.12	23,387.8
45 – 49	128	124	4	12.23	38,072.8	17,075.1	44.85	20,997.7
50 – 54	64	62	2	6.11	37,553.1	17,253.0	45.94	20,300.1
55 – 59	49	45	4	4.44	34,864.0	16,335.7	46.86	18,528.3
60 – 64	52	43	9	4.24	29,037.5	10,904.1	37.55	18,133.4
65 – 69	64	58	6	5.71	24,641.2	10,806.5	43.86	13,834.8
70 – 74	32	31	1	3.06	19,086.4	8,597.8	45.05	10,488.5
75 and over	7	7	0	.69	16,320.6	9,620.0	58.94	6,700.6

TABLE A7 (Continued)

Gross Income, Expenses, and Net Income from Private Practice

(d) By Year of Graduation

Year of graduation	Number of question-naires returned	Number replied	Number not replied	Percentage of dentists in sample responding	Gross income per dentist	Expenses per dentist	Expenses: gross income ratio	Net income per dentist
1962	35	32	3	3.82	37,291.6	17,920.5	48.06	19,371.1
1961	37	35	2	4.18	35,387.8	17,288.2	48.85	18,099.8
1960	40	40	0	4.77	37,285.2	18,000.9	48.28	19,284.3
1959	42	39	3	4.65	38,295.4	17,127.6	44.72	21,167.9
1954	176	168	8	20.05	40,509.4	18,239.1	45.02	22,270.3
1949 – 1953	217	209	8	24.94	41,170.9	18,149.6	44.08	23,021.3
1944 – 1948	69	67	2	8.00	40,518.6	18,151.2	44.80	22,367.4
1939 – 1943	58	57	1	6.80	38,971.7	18,364.4	47.12	20,607.3
1934 – 1938	48	45	3	5.37	35,681.2	15,644.2	43.84	20,037.1
1929 – 1933	42	37	5	4.42	33,344.5	13,932.6	41.78	19,411.4
1924 – 1928	55	46	9	5.49	25,433.7	11,455.7	45.04	13,978.4
1919 – 1923	52	48	4	5.73	20,604.5	8,793.1	42.68	11,811.4
1914 – 1918	14	14	0	1.67	20,274.4	10,355.1	51.08	9,919.2

(e) By Organization of Practice

Organization of Practice	Number of question-naires returned	Number replied	Number not replied	Percentage of dentists in sample responding	Gross income per dentist	Expenses per dentist	Expenses: gross income ratio	Net income per dentist
Solo	898	838	60	82.08	35,588.6	16,408.9	46.11	19,179
Sharing	151	141	10	13.81	35,638.4	16,373.7	45.94	19,264
Partnership	32	29	3	2.84	45,354.7	19,460.9	42.91	25,893
Other	14	13	1	1.27	35,200.8	15,563.7	44.21	19,637

TABLE A7 (Continued)

Gross Income, Expenses, and Net Income from Private Practice

(f) By Type of Practice

Type of practice	Number of questionnaires returned	Number replied	Number not replied	Percentage of dentists in sample responding	Gross income per dentist	Expenses per dentist	Expenses: gross income ratio	Net income per dentist
Practitioners	1,010	943	67	92.00	34,932.4	16,142.6	46.21	18,789.9
Specialists	85	78	7	7.61	47,520.0	20,796.2	43.76	26,723.8
Oral surgeon	16	14	2	—	57,540.9	24,644.3	42.83	32,896.5
Orthodontist	35	32	3	—	45,771.4	18,345.0	40.08	27,425.5
Periodontist	12	11	1	—	36,553.0	16,782.2	45.91	19,770.4
Other	25	24	1	—	46,894.5	22,865.6	48.76	24,028.9
Not stated	6	4	2	.39	24,878.8	9,998.8	40.19	14,880.0

TABLE A8

Gross Income, Expenses, and Net Income from Private Practice

(a) By Number of Chairs and Full-Time Employees

Number of chairs and number and type of full-time employees	Number of question-naires returned	Number replied	Number not replied	Percentage of dentists in sample responding	Gross income per dentist	Expenses per dentist	Expenses: gross income ratio	Net income per dentist
1 Chair								
No employees	84	75	9	7.35	16,545.6	6,943.4	41.97	9,602
1 assistant	205	191	14	18.70	28,607.2	12,655.6	44.24	15,951
1 secretary	10	9	1	.88	24,317.7	10,646.7	43.78	13,671
All other	42	35	7	3.43	32,587.0	16,522.3	50.70	16,064
2 chairs								
No employees	22	18	4	1.76	27,489.1	12,347.3	44.92	15,141
1 assistant	363	347	16	33.99	34,188.2	15,005.6	43.89	19,182
1 hygienist and 1 assistant	11	11	—	1.08	47,347.5	22,188.4	46.86	25,159
1 technician and 1 assistant	6	5	1	.49	42,991.4	17,548.4	40.82	25,443
2 or more assistants	74	73	1	7.15	42,983.0	20,724.5	48.22	22,258
1 secretary	14	14	—	1.37	32,624.9	15,190.4	46.56	17,434
1 assistant and 1 secretary	102	99	3	9.70	41,411.1	19,969.5	48.22	21,441
All other	63	55	8	5.39	48,753.3	23,421.8	48.04	25,331
3 or more chairs								
No employees	4	3	1	.29	46,323.7	22,470.3	48.51	23,853
1 assistant	17	15	2	1.47	46,036.7	18,907.9	41.07	27,128
2 or more assistants	18	16	2	1.58	50,357.6	24,667.0	48.98	25,690
1 assistant and 1 secretary	14	13	1	1.27	49,077.5	23,831.7	48.56	25,245
2 or more assistants and 1 secretary	3	2	1	.20	34,194.0	19,483.5	56.98	14,710
All other	42	40	2	3.91	68,690.2	34,550.1	50.30	34,140

TABLE A8 (Continued)

Gross Income, Expenses, and Net Income from Private Practice

(b) By Number of Employees

Number of employees		Number of question-naires returned	Number replied	Number not replied	Percentage of dentists in sample responding	Gross income per dentist	Expenses per dentist	Expenses: gross income ratio	Net income per dentist
Full time	Part time								
0	0	62	54	8	5.27	15,941.7	6,618.3	41.52	9,323
0	1	37	33	4	3.22	20,201.1	8,734.8	43.24	11,466
0	2	7	6	1	.59	31,666.7	14,052.7	44.38	17,614
0	3+	7	6	1	.59	41,725.5	20,363.2	48.80	21,362
1	0	406	380	26	37.11	29,773.4	12,821.6	43.06	16,951
1	1	159	153	6	14.94	36,038.3	16,158.8	44.84	19,879
1	2	42	40	2	3.91	40,556.7	18,878.4	46.55	21,678
1	3+	11	11	—	1.07	43,962.1	21,040.1	47.86	22,922
2	0	173	164	9	16.02	40,731.7	19,121.0	46.94	21,610
2	1	62	60	2	5.86	43,996.7	21,344.9	48.51	22,651
2	2	18	16	2	1.56	41,879.3	25,611.4	61.16	16,267
2	3+	7	5	2	.49	49,332.4	26,913.0	54.55	22,419
3	0	42	40	2	3.91	51,990.2	25,068.4	48.22	26,921
3	1	18	16	2	1.56	53,008.0	25,793.8	48.66	27,214
3	2	9	9	—	.88	65,477.1	36,171.2	55.24	29,305
3	3+	2	2	—	.20	36,691.5	16,032.0	43.69	20,659
4	0	14	13	1	1.27	60,370.4	29,360.6	48.63	31,009
4	1	1	1	—	—	—	—	—	—
4	2	—	—	—	—	—	—	—	—
4	3+	1	1	—	—	—	—	—	—
5+	0	14	10	4	.98	73,951.4	33,787.5	45.69	40,163
5+	1	1	1	—	—	—	—	—	—
5+	2	3	2	1	—	—	—	—	—
5+	3+	1	1	—	—	—	—	—	—

TABLE A8 (Continued)

Gross Income, Expenses, and Net Income from Private Practice

(c) By Number of Dental Chairs

Number of chairs	Number of question-naires returned	Number replied	Number not replied	Percentage of dentists in sample responding	Gross income per dentist	Expenses per dentist	Expenses: gross income ratio	Net income per dentist
1	344	313	31	30.57	25,992.3	11,617.5	44.70	14,370
2	657	622	35	60.74	37,759.7	17,285.8	45.78	20,470
3	82	75	7	7.32	54,985.3	26,570.4	48.32	28,410
4	9	7	2	.68	70,590.6	34,351.7	48.66	36,230
5+	3	3	—	.29	—	—	—	—
6	2	2	—	.20	—	—	—	—
Not stated	3	2	1	.20	—	—	—	—

(d) By Whether or Not X-Ray Machines are Used

X-rays	Number of question-naires returned	Number replied	Number not replied	Percentage of dentists in sample responding	Gross income per dentist	Expenses per dentist	Expenses: gross income ratio	Net income per dentist
Yes	1,069	996	73	97.17	36,054.2	16,612.0	46.08	19,442
No	29	27	2	2.63	29,527.5	12,016.5	40.70	17,511
Not stated	3	2	1	.20	20,047.5	7,265.5	36.24	12,782

(e) By Whether or Not High Speed Equipment is Used

High speed equipment	Number of question-naires returned	Number replied	Number not replied	Percentage of dentists in sample responding	Gross income per dentist	Expenses per dentist	Expenses: gross income ratio	Net income per dentist
Yes	1,032	963	69	93.95	35,908.3	16,634.4	46.32	19,273
No	62	56	6	5.46	33,762.7	13,394.8	39.67	20,367
Not stated	7	6	1	.59	46,158.7	19,251.5	41.71	26,907

TABLE A8 (Continued)

Gross Income, Expenses, and Net Income from Private Practice

(f) By Whether or Not General Anaesthesia Is Used

General anaesthesia	Number of question-naires returned	Number replied	Number not replied	Percentage of dentists in sample responding	Gross income per dentist	Expenses per dentist	Expenses: gross income ratio	Net income per dentist
Yes	83	80	3	7.80	42,792.6	19,448.9	45.45	23,343
No	999	928	71	90.74	35,314.0	16,249.5	46.01	19,064
Not stated	19	17	2	1.73	32,505.5	14,652.5	45.08	17,853

(g) By Extent of Busyness

Extent of busyness	Number of question-naires returned	Number replied	Number not replied	Percentage of dentists in sample responding	Gross income per dentist	Expenses per dentist	Expenses: gross income ratio	Net income per dentist
Dentists too busy to treat all people requesting appointments	392	374	18	36.56	37,336.7	16,856.6	45.15	20,480
All people requesting appointments received them but dentist felt more rushed and/or worked more hours than liked	250	234	16	22.87	37,901.2	17,430.6	45.99	20,470
Dentist provided dental care for all who requested appointments, had enough but not too many patients	367	336	31	32.84	34,874.2	16,098.0	46.16	18,776
Dentists was not busy enough, would like to have had more patients	80	72	8	7.04	27,684.2	13,872.3	50.11	13,811
Not stated	10	7	3	.68	23,243.0	10,191.7	43.85	13,051

TABLE A9

Average Expenditures by Specified Items of Professional Expense

(a) According to County

County	Office rent	Utilities	Insurance office	Commercial charges	Dental supplies and drugs	Salaries	Fringe benefits	Travel expenses	Depreciation on equip.	Other expenses	Total
Algoma											
Sum per dentist	1,297.2	312.5	192.9	3,954.8	1,878.6	3,532.1	311.2	638.7	632.8	1,846.8	14,003.4
No. quest. returned	14	—	—	—	—	—	—	—	—	—	—
No. replied	13	12	12	13	13	11	6	11	13	13	14
No. not replied	1	2	2	1	1	3	8	3	1	1	0
% of dentists responding	1.4	1.5	1.5	1.5	1.5	1.3	1.7	1.4	1.7	1.6	1.4
Brant											
Sum per dentist	1,510.0	417.6	94.3	3,715.3	2,706.7	3,304.5	150.0	247.8	1,276.7	714.0	9,892.2
No. quest returned	7	—	—	—	—	—	—	—	—	—	—
No. replied	6	5	3	4	3	4	2	6	3	5	6
No. not replied	1	2	4	3	4	3	5	1	4	2	1
% of dentists responding	.7	.6	.4	.5	.4	.5	.6	.7	.4	.6	.6
Bruce											
Sum per dentist	612.5	176.3	60.5	2,557.3	1,750.0	2,715.0	35.0	300.0	328.7	474.3	10,490.8
No. quest returned	4	—	—	—	—	—	—	—	—	—	—
No. replied	4	3	2	3	2	4	2	3	3	3	4
No. not replied	0	1	2	1	2	0	2	1	1	1	0
% of dentists responding	.4	.4	.3	.4	.2	.5	.6	.4	.4	.4	.4

TABLE A9 (Continued)

Average Expenditures by Specified Items of Professional Expense

(a) According to County *(continued)*

County	Office rent	Utilities	Insurance office	Commercial charges	Dental supplies and drugs	Salaries	Fringe benefits	Travel expenses	Depreciation on equip.	Other expenses	Total
Carleton											
Sum per dentist	2,524.9	471.6	481.2	3,256.6	2,754.0	6,179.5	285.1	770.4	1,077.5	2,054.6	18,068.6
No. quest. returned	72	—	—	—	—	—	—	—	—	—	—
No. replied	59	51	52	48	52	59	23	52	44	53	66
No. not replied	13	21	20	24	20	13	49	20	28	19	6
% of dentists responding	6.4	6.2	6.5	5.7	6.0	6.8	6.6	6.4	6.0	6.4	6.6
Cochrane											
Sum per dentist	1,351.7	435.5	163.8	5,484.6	3,311.0	3,363.6	122.5	541.8	308.0	1,508.5	14,185.9
No. quest. returned	7	—	—	—	—	—	—	—	—	—	—
No. replied	6	5	4	5	6	5	2	6	5	6	7
No. not replied	1	2	3	2	1	2	5	1	2	1	0
% of dentists responding	.7	.6	.5	.6	.7	.6	.6	.7	.7	.7	.7
Dufferin											
Sum per dentist	1,050.0	327.0	103.0	2,688.7	1,620.7	2,417.0	82.0	264.7	828.5	656.0	9,275.0
No. quest. returned	3	—	—	—	—	—	—	—	—	—	—
No. replied	2	2	3	3	3	3	2	3	2	3	3
No. not replied	1	1	0	0	0	0	1	0	1	0	0
% of dentists responding	.2	.2	.4	.4	.4	.3	.6	.4	.3	.4	.3

TABLE A9 (Continued)

Average Expenditures by Specified Items of Professional Expense

(a) According to County *(continued)*

County	Office rent	Utilities	Insurance office	Commercial charges	Dental supplies and drugs	Salaries	Fringe benefits	Travel expenses	Depreciation on equip.	Other expenses	Total
Durham											
Sum per dentist	1,205.0	409.0	167.7	2,637.5	2,861.0	3,028.7	—	658.7	714.0	2,058.0	14,689.3
No. quest. returned	4	—	—	—	—	—	—	—	—	—	—
No. replied	3	3	3	2	3	3	—	3	3	3	4
No. not replied	1	1	1	2	1	1	4	1	1	1	0
% of dentists responding	.3	.4	.4	.2	.4	.3	—	.4	.4	.4	.4
Elgin											
Sum per dentist	884.6	278.4	228.3	3,003.3	2,264.2	2,758.7	156.2	395.8	800.3	1,691.2	10,345.5
No. quest. returned	14	—	—	—	—	—	—	—	—	—	—
No. replied	12	9	11	9	11	11	5	10	10	11	12
No. not replied	2	5	3	5	3	3	9	4	4	3	2
% of dentists responding	1.3	1.1	1.4	1.1	1.3	1.3	1.4	1.2	1.3	1.3	1.2
Essex											
Sum per dentist	1,802.0	345.9	162.9	3,352.1	2,659.9	5,140.9	179.6	472.2	713.7	1,526.1	15,442.6
No. quest. returned	29	—	—	—	—	—	—	—	—	—	—
No. replied	23	21	18	23	22	21	7	21	18	19	23
No. not replied	6	8	11	6	7	8	22	8	11	10	6
% of dentists responding	2.5	2.6	2.3	2.7	2.5	2.4	2.0	2.6	2.4	2.3	2.3

TABLE A9 (Continued)

Average Expenditures by Specified Items of Professional Expense

(a) ACCORDING TO COUNTY *(continued)*

County	Office rent	Utilities	Insurance office	Commercial charges	Dental supplies and drugs	Salaries	Fringe benefits	Travel expenses	Depreciation on equip.	Other expenses	Total
FRONTENAC											
Sum per dentist	1,710.9	245.7	126.7	2,977.2	2,309.3	4,446.1	157.1	1,172.7	503.7	1,838.8	15,003.7
No. quest. returned	16	—	—	—	—	—	—	—	—	—	—
No. replied	13	10	10	12	12	12	7	11	9	12	14
No. not replied	3	6	6	4	4	4	9	5	7	4	2
% of dentists responding	1.4	1.2	1.3	1.4	1.4	1.4	2.0	1.4	1.2	1.5	1.4
GREY											
Sum per dentist	804.0	253.3	94.4	2,425.3	1,908.8	3,255.7	82.2	240.4	710.4	1,301.3	10,703.9
No. quest. returned	7	—	—	—	—	—	—	—	—	—	—
No. replied	7	6	5	7	6	7	5	5	7	7	7
No. not replied	—	1	2	—	1	—	2	2	—	—	—
% of dentists responding	.8	.7	.6	.8	.7	.8	1.4	.6	.9	.9	.7
HALDIMAND											
Sum per dentist	—	—	—	—	—	—	—	—	—	—	—
No. quest. returned	—	—	—	—	—	—	—	—	—	—	—
No. replied	—	—	—	—	—	—	—	—	—	—	—
No. not replied	1	1	1	1	1	1	1	1	1	1	1
% of dentists responding	—	—	—	—	—	—	—	—	—	—	—

TABLE A9 (Continued)

Average Expenditures by Specified Items of Professional Expense

(a) According to County *(continued)*

County	Office rent	Utilities	Insurance office	Commercial charges	Dental supplies and drugs	Salaries	Fringe benefits	Travel expenses	Depreciation on equip.	Other expenses	Total
HALIBURTON	—	—	—	—	—	—	—	—	—	—	—
HALTON											
Sum per dentist	2,071.8	556.3	240.1	3,450.6	4,300.3	4,578.0	155.5	368.4	1,248.8	1,840.6	15,355.1
No. quest. returned	32	—	—	—	—	—	—	—	—	—	—
No. replied	25	25	19	24	24	27	10	22	26	23	31
No. not replied	7	7	13	8	8	5	22	10	6	9	1
% of dentists responding	2.7	3.1	2.4	2.8	2.8	3.1	2.9	2.7	3.5	2.8	3.1
HASTINGS											
Sum per dentist	1,858.3	860.8	1,914.6	4,299.6	5,739.2	6,250.3	321.3	476.4	1,633.6	2,304.8	22,690.3
No. quest. returned	11	—	—	—	—	—	—	—	—	—	—
No. replied	9	6	5	8	9	8	3	5	5	6	10
No. not replied	2	5	6	3	2	3	8	6	6	5	1
% of dentists responding	1.0	.7	.6	1.0	1.0	.9	.8	.6	.7	.7	1.0
HURON	—	—	—	—	—	—	—	—	—	—	—
KENORA											
Sum per dentist	1,686.7	60.5	134.7	1,548.3	1,825.0	2,300.0	90.0	792.5	603.3	1,722.5	12,058.0
No. quest. returned	3	—	—	—	—	—	—	—	—	—	—
No. replied	3	2	3	3	3	3	2	2	3	2	3
No. not replied	—	1	—	—	—	—	1	1	—	1	—
% of dentists responding	.3	.2	.4	.4	.4	.3	.6	.3	.4	.2	.3

TABLE A9 (Continued)

Average Expenditures by Specified Items of Professional Expense

(a) ACCORDING TO COUNTY *(continued)*

County	Office rent	Utilities	Insurance office	Commercial charges	Dental supplies and drugs	Salaries	Fringe benefits	Travel expenses	Depreciation on equip.	Other expenses	Total
KENT											
Sum per dentist	784.8	395.0	176.0	4,329.8	2,096.7	2,709.6	214.8	309.3	833.6	1,305.3	12,235.3
No. quest. returned	14	—	—	—	—	—	—	—	—	—	—
No. replied	13	13	12	12	13	12	4	10	9	10	13
No. not replied	1	1	2	2	1	2	10	4	5	4	1
% of dentists responding	1.4	1.6	1.5	1.4	1.5	1.4	1.1	1.2	1.2	1.2	1.3
LAMBTON											
Sum per dentist	3,554.3	1,046.0	859.4	7,810.4	9,895.4	5,006.7	101.3	695.9	1,500.0	1,762.3	18,104.3
No. quest. returned	11	—	—	—	—	—	—	—	—	—	—
No. replied	10	8	8	9	8	9	7	9	9	7	10
No. not replied	1	3	3	2	3	2	4	2	2	4	1
% of dentists	1.1	1.0	1.0	1.1	.9	1.0	2.0	1.1	1.2	.9	1.0
LANARK											
Sum per dentist	1,052.0	707.5	262.3	3,642.7	2,157.3	4,917.5	100.0	196.7	1,831.0	1,217.0	13,120.0
No. quest. returned	3	—	—	—	—	—	—	—	—	—	—
No. replied	3	2	3	3	3	2	1	3	2	2	3
No. not replied	—	1	—	—	—	1	2	—	1	1	—
% of dentists responding	.3	.2	.4	.4	.4	.2	.3	.4	.3	.2	.3

TABLE A9 (Continued)
Average Expenditures by Specified Items of Professional Expense

(a) According to County *(continued)*

County	Office rent	Utilities	Insurance office	Commercial charges	Dental supplies and drugs	Salaries	Fringe benefits	Travel expenses	Depreciation on equip.	Other expenses	Total
LEEDS											
Sum per dentist	1,513.3	425.0	88.0	2,856.7	2,234.0	9,310.0	189.0	304.7	727.3	470.3	17,993.0
No. quest. returned	3	—	—	—	—	—	—	—	—	—	—
No. replied	3	3	3	3	3	3	1	3	3	3	3
No. not replied	—	—	—	—	—	—	2	—	—	—	—
% of dentists responding	.3	.4	.4	.4	.4	.3	.3	.4	.4	.4	.3
LENNOX ADDINGTON	—	—	—	—	—	—	—	—	—	—	—
LINCOLN											
Sum per dentist	2,660.3	527.6	243.9	3,335.2	2,557.3	5,698.1	421.3	706.0	1,032.0	2,214.0	19,507.6
No. quest. returned	24	—	—	—	—	—	—	—	—	—	—
No. replied	21	19	19	19	20	20	9	18	18	21	21
No. not replied	3	5	5	5	4	4	15	6	6	3	3
% of dentists responding	2.3	2.3	2.4	2.3	2.3	2.3	2.6	2.2	2.4	2.5	2.1
MANITOULIN	—	—	—	—	—	—	—	—	—	—	—

TABLE A9 (Continued)

Average Expenditures by Specified Items of Professional Expense

(a) ACCORDING TO COUNTY *(continued)*

County	Office rent	Utilities	Insurance office	Commercial charges	Dental supplies and drugs	Salaries	Fringe benefits	Travel expenses	Depreciation on equip.	Other expenses	Total
MIDDLESEX											
Sum per dentist	1,835.8	501.9	372.3	3,340.0	2,140.2	4,718.8	136.3	615.8	825.8	2,008.1	16,012.6
No. quest. returned	45	—	—	—	—	—	—	—	—	—	—
No. replied	36	35	34	39	36	36	12	37	29	35	41
No. not replied	10	11	12	7	10	10	34	9	17	11	5
% of dentists responding	3.9	4.3	4.3	4.6	4.1	4.1	3.4	4.6	3.9	4.2	4.1
MUSKOKA											
Sum per dentist	900.0	243.0	28.0	1,991.0	1,575.7	4,069.7	59.0	227.5	229.0	915.0	9,828.0
No. quest. returned	3	—	—	—	—	—	—	—	—	—	—
No. replied	3	3	3	3	3	3	2	2	2	2	2
No. not replied	—	—	—	—	—	—	1	1	1	1	1
% of dentists responding	.3	.4	.4	.4	.4	.3	.6	.3	.3	.2	.2
NIPISSING											
Sum per dentist	1,399.9	338.1	139.8	4,017.7	2,427.5	4,314.1	1,384.5	564.2	355.9	2,116.8	16,585.5
No. quest. returned	10	—	—	—	—	—	—	—	—	—	—
No. replied	10	8	9	9	10	10	4	9	8	9	10
No. not replied	—	2	1	1	—	—	6	1	2	1	—
% of dentists responding	1.1	1.0	1.1	1.1	1.2	1.2	1.1	1.1	1.1	1.1	1.0

TABLE A9 (Continued)

Average Expenditures by Specified Items of Professional Expense

(a) According to County *(continued)*

County	Office rent	Utilities	Insurance office	Commercial charges	Dental supplies and drugs	Salaries	Fringe benefits	Travel expenses	Depreciation on equip.	Other expenses	Total
Norfolk											
Sum per dentist	1,101.4	338.4	127.9	3,168.1	1,621.7	3,904.9	10.0	337.3	1,194.0	1,434.1	12,052.5
No. quest. returned	8	—	—	—	—	—	—	—	—	—	—
No. replied	7	7	7	8	7	7	1	6	6	7	8
No. not replied	1	1	1	—	1	1	7	2	2	1	—
% of dentists responding	.8	.8	.3	.7	.8	.9	.9	1.0	.8	.9	.8
Northumberland											
Sum per dentist	1,116.4	292.2	120.3	6,779.5	3,763.3	6,652.5	300.0	796.8	1,341.0	1,538.0	20,861.2
No. quest. returned	5	—	—	—	—	—	—	—	—	—	—
No. replied	5	5	4	4	4	4	1	5	3	2	5
No. not replied	—	—	1	1	1	1	4	—	2	3	—
% of dentists responding	.5	.5	.3	.6	.5	.6	.5	.5	.4	.2	.5
Ontario											
Sum per dentist	1,952.7	437.1	277.5	4,405.7	3,583.2	8,154.6	277.7	422.8	1,282.4	2,047.3	20,850.2
No. quest. returned	23	—	—	—	—	—	—	—	—	—	—
No. replied	19	17	16	17	18	18	7	18	16	19	21
No. not replied	4	6	7	6	5	5	16	5	7	4	2
% of dentists responding	2.1	2.1	2.0	2.2	2.1	2.1	2.0	2.0	2.1	2.3	2.1

TABLE A9 (Continued)

Average Expenditures by Specified Items of Professional Expense

(a) According to County *(continued)*

County	Office rent	Utilities	Insurance office	Commercial charges	Dental supplies and drugs	Salaries	Fringe benefits	Travel expenses	Depreciation on equip.	Other expenses	Total
Oxford											
Sum per dentist	1,729.1	568.1	204.8	3,104.5	2,461.3	4,549.7	94.3	424.9	1,266.1	2,072.5	14,133.2
No. quest. returned	13	—	—	—	—	—	—	—	—	—	—
No. replied	10	10	10	10	12	10	4	9	9	11	13
No. not replied	3	3	3	3	1	3	9	4	4	2	—
% of dentists responding	1.1	1.2	1.3	1.2	1.4	1.2	1.1	1.1	1.2	1.3	1.3
Parry Sound											
Sum per dentist	957.5	257.7	130.0	3,167.0	2,436.5	2,091.3	96.5	313.0	828.3	1,489.5	8,787.4
No. quest. returned	5	—	—	—	—	—	—	—	—	—	—
No. replied	4	3	1	3	4	3	2	4	3	4	5
No. not replied	1	2	4	2	1	2	3	1	2	1	—
% of dentists responding	.4	.4	.1	.4	.5	.3	.6	.5	.4	.5	.5
Peel											
Sum per dentist	1,870.7	442.1	233.6	3,546.6	2,624.9	4,839.1	90.6	458.3	1,827.3	1,854.6	17,546.8
No. quest. returned	22	—	—	—	—	—	—	—	—	—	—
No. replied	20	20	20	20	20	21	12	18	19	21	21
No. not replied	2	2	2	2	2	1	10	4	3	1	1
% of dentists responding	2.2	2.4	2.5	2.4	2.3	2.4	3.4	2.2	2.5	2.5	2.1

TABLE A9 (Continued)

Average Expenditures by Specified Items of Professional Expense

(a) According to County *(continued)*

County	Office rent	Utilities	Insurance office	Commercial charges	Dental supplies and drugs	Salaries	Fringe benefits	Travel expenses	Depreciation on equip.	Other expenses	Total
Perth											
Sum per dentist	1,053.0	445.4	132.0	2,118.6	1,793.0	4,106.4	135.5	449.8	964.0	2,770.8	12,455.2
No. quest. returned	6	—	—	—	—	—	—	—	—	—	—
No. replied	5	5	4	5	5	5	2	4	3	5	6
No. not replied	1	1	2	1	1	1	4	2	3	1	—
% of dentists responding	.6	.6	.6	.5	.5	.6	.5	.6	.4	.6	.6
Peterborough											
Sum per dentist	1,707.5	372.3	254.7	2,551.1	1,772.8	5,218.2	518.3	308.2	1,103.8	1,904.4	12,270.4
No. quest. returned	15	—	—	—	—	—	—	—	—	—	—
No. replied	13	14	12	13	14	12	3	12	12	14	15
No. not replied	2	1	3	2	1	3	12	3	3	1	—
% of dentists responding	1.6	1.4	.8	1.5	1.4	1.7	1.5	1.5	1.6	1.7	1.5
Renfrew											
Sum per dentist	2,049.8	385.6	139.5	3,335.8	1,839.9	3,640.9	81.5	3,603.9	708.0	1,562.7	12,259.2
No. quest. returned	13	—	—	—	—	—	—	—	—	—	—
No. replied	13	10	11	11	12	12	12	4	13	11	13
No. not replied	—	3	2	2	1	1	9	—	2	2	—
% of dentists responding	1.3	1.4	3.4	.5	1.4	1.2	1.3	1.3	1.7	1.3	1.3

TABLE A9 (Continued)

Average Expenditures by Specified Items of Professional Expense

(a) ACCORDING TO COUNTY *(continued)*

County	Office rent	Utilities	Insurance office	Commercial charges	Dental supplies and drugs	Salaries	Fringe benefits	Travel expenses	Depreciation on equip.	Other expenses	Total
RUSSELL	—	—	—	—	—	—	—	—	—	—	—
SIMCOE											
Sum per dentist	1,924.3	421.2	184.0	3,535.9	2,636.8	4,191.1	104.5	397.3	919.5	1,746.8	15,723.0
No. quest. returned	21	—	—	—	—	—	—	—	—	—	—
No. replied	18	15	15	16	17	16	10	15	14	16	20
No. not replied	3	6	6	5	4	5	11	6	7	5	1
% of dentists responding	2.0	1.8	2.9	1.9	2.0	1.8	1.9	1.9	1.9	1.9	2.0
STORMONT											
Sum per dentist	1,871.7	448.3	347.3	4,551.3	3,574.7	6,655.3	297.5	616.8	744.3	1,966.8	22,028.2
No. quest. returned	6	—	—	—	—	—	—	—	—	—	—
No. replied	6	6	6	6	6	6	2	6	4	6	6
No. not replied	—	—	—	—	—	—	4	—	2	—	—
% of dentists responding	.7	.7	.6	.7	.7	.7	.8	.7	.5	.7	.6
SUDBURY											
Sum per dentist	1,827.7	405.1	239.1	5,861.8	2,728.1	4,557.0	205.8	436.3	972.6	2,280.6	18,690.1
No. quest. returned	—	—	—	—	—	—	—	—	—	—	—
No. replied	18	17	16	17	15	18	9	16	11	17	19
No. not replied	3	4	5	4	6	3	12	5	10	4	2
% of dentists responding	1.7	2.1	2.6	2.0	2.0	2.1	2.0	2.0	1.5	2.1	1.9

TABLE A9 (Continued)

Average Expenditures by Specified Items of Professional Expense

(a) According to County *(continued)*

County	Office rent	Utilities	Insurance office	Commercial charges	Dental supplies and drugs	Salaries	Fringe benefits	Travel expenses	Depreciation on equip.	Other expenses	Total
Thunder Bay											
Sum per dentist	1,666.6	325.7	295.1	4,220.7	2,908.4	4,804.6	215.0	474.9	933.8	2,440.6	16,773.9
No. quest. returned	—	—	—	—	—	—	—	—	—	—	—
No. replied	20	20	20	19	21	29	8	19	18	20	22
No. not replied	2	2	2	3	1	2	14	3	4	2	—
% of dentists responding	2.4	3.3	2.3	2.3	2.2	2.4	2.5	2.3	2.4	2.4	2.2
Timiskaming											
Sum per dentist	1,153.5	920.3	119.8	2,314.7	3,198.3	4,050.0	287.0	389.5	626.5	1,411.2	13,776.8
No. quest. returned	—	—	—	—	—	—	—	—	—	—	—
No. replied	6	6	5	6	6	6	3	6	6	5	6
No. not replied	—	—	1	—	—	—	3	—	—	1	—
% of dentists responding	.7	.7	.8	.7	.7	.7	.6	.7	.8	.6	.6
Victoria											
Sum per dentist	1,058.3	314.0	133.3	2,689.7	2,470.3	2,589.0	—	300.0	1,645.0	1,399.7	12,052.0
No. quest. returned	3	—	—	—	—	—	—	—	—	—	—
No. replied	3	3	3	3	3	3	—	3	2	3	3
No. not replied	—	—	—	—	—	—	3	—	1	—	—
% of dentists responding	.4	.3	—	.4	.3	.4	.4	.4	.3	.4	.3

TABLE A9 (Continued)

Average Expenditures by Specified Items of Professional Expense

(a) According to County *(continued)*

County	Office rent	Utilities	Insurance office	Commercial charges	Dental supplies and drugs	Salaries	Fringe benefits	Travel expenses	Depreciation on equip.	Other expenses	Total
WATERLOO											
Sum per dentist	1,594.4	471.0	519.5	3,417.9	2,399.8	5,318.1	127.4	504.4	1,059.5	2,020.2	16,692.4
No. quest. returned	44	—	—	—	—	—	—	—	—	—	—
No. replied	40	36	33	38	37	37	12	38	36	38	42
No. not replied	4	8	11	6	7	7	32	6	8	6	2
% of dentists responding	4.3	4.3	3.4	4.7	4.3	4.4	4.1	4.5	4.8	4.6	4.2
WELLAND											
Sum per dentist	1,387.2	435.5	206.9	3,889.6	3,461.3	6,259.5	178.8	594.3	1,174.7	1,958.6	17,454.5
No. quest. returned	24	—	—	—	—	—	—	—	—	—	—
No. replied	22	20	20	18	19	21	11	19	23	18	24
No. not replied	2	4	4	6	5	3	13	5	1	6	0
% of dentists responding	2.2	2.4	3.2	2.3	2.4	2.4	2.5	2.1	3.1	2.2	2.4
WELLINGTON											
Sum per dentist	1,823.3	572.6	258.3	258.3	2,627.1	4,940	330.0	472.8	784.7	2,778.5	19,229.1
No. quest. returned	13	—	—	—	—	—	—	—	—	—	—
No. replied	13	11	10	13	13	12	4	12	12	11	13
No. not replied	—	2	3	—	—	1	9	1	1	2	—
% of dentists responding	1.5	1.4	1.1	1.5	1.4	1.3	1.3	1.5	1.6	1.3	1.3

TABLE A9 (Continued)

Average Expenditures by Specified Items of Professional Expense

(a) According to County *(continued)*

County	Office rent	Utilities	Insurance office	Commercial charges	Dental supplies and drugs	Salaries	Fringe benefits	Travel expenses	Depreciation on equip.	Other expenses	Total
Wentworth											
Sum per dentist	1,789.2	396.5	414.7	3,485.4	2,929.7	4,680.4	791.7	596.3	1,150.1	1,885.2	16,332.1
No. quest. returned	60	—	—	—	—	—	—	—	—	—	—
No. replied	50	41	42	47	49	49	21	45	39	41	54
No. not replied	10	19	18	13	11	11	39	15	21	19	6
% of dentists responding	5.6	5.6	6.0	5.5	5.4	5.0	5.3	5.6	5.2	5.0	5.4
York											
Sum per dentist	2,136.0	565.1	318.1	4,128.9	2,279.6	5,449.9	281.8	469.1	1,170.2	1,768.2	17,009.9
No. quest. returned	395	—	—	—	—	—	—	—	—	—	—
No. replied	335	293	293	300	314	301	106	293	260	294	364
No. not replied	60	102	102	95	81	94	289	102	135	101	31
% of dentists responding	36.1	34.6	30.4	36.1	36.4	35.7	36.8	35.5	34.8	35.5	36.4

TABLE A9 (Continued)

Average Expenditures by Specified Items of Professional Expense

(b) ACCORDING TO CITY SIZE

Size of city	Office rent	Utilities	Insurance office	Commercial charges	Dental supplies and drugs	Salaries	Fringe benefits	Travel expenses	Depreciation on equip.	Other expenses	Total
Under 1,000											
Sum per dentist	425.0	426.5	88.0	3,736.3	1,880.4	2,460.8	36.0	424.0	84.0	778.2	7,978.0
No. quest. returned	5	—	—	—	—	—	—	—	—	—	—
No. replied	4	4	3	3	5	4	1	4	1	5	5
No. not replied	1	1	2	2	—	1	4	1	4	—	—
% of dentists responding	.4	.5	.4	.4	.6	.5	.3	.5	.1	.6	.5
1,000–2,499											
Sum per dentist	1,189.5	445.0	186.9	3,505.6	1,783.6	3,124.3	105.3	369.5	800.7	1,373.7	11,903.1
No. quest. returned	25	—	—	—	—	—	—	—	—	—	—
No. replied	19	16	16	17	15	16	6	17	18	19	21
No. not replied	6	9	9	8	10	9	19	8	7	6	4
% of dentists responding	2.0	1.9	2.0	2.0	1.7	1.8	1.7	2.1	2.4	2.3	2.1
2,500–4,999											
Sum per dentist	1,082.2	384.8	141.1	3,231.4	2,311.2	3,803.4	131.8	366.6	859.9	1,371.0	13,831.6
No. quest. returned	55	—	—	—	—	—	—	—	—	—	—
No. replied	49	44	41	46	46	47	18	45	41	45	53
No. not replied	6	11	14	9	9	8	37	10	14	10	2
% of dentists responding	5.2	5.3	5.0	5.4	5.2	5.3	5.2	5.4	5.4	5.3	5.2

TABLE A9 (Continued)

Average Expenditures by Specified Items of Professional Expense

(b) According to City Size *(continued)*

Size of city	Office rent	Utilities	Insurance office	Commercial charges	Dental supplies and drugs	Salaries	Fringe benefits	Travel expenses	Depreciation on equip.	Other expenses	Total
5,000–9,999											
Sum per dentist	1,364.9	414.6	277.8	3,028.2	2,415.9	4,533.1	541.9	522.9	949.0	1,453.2	13,965.6
No. quest. returned	62	—	—	—	—	—	—	—	—	—	—
No. replied	55	50	47	52	52	51	23	49	44	48	59
No. not replied	7	12	15	10	10	11	39	13	18	14	3
% of dentists responding	5.9	6.0	5.8	6.1	5.9	5.8	6.6	5.9	5.8	5.7	5.8
10,000–14,999											
Sum per dentist	1,405.2	424.0	199.8	4,491.8	3,188.5	4,604.2	149.7	462.2	1,563.5	1,951.5	17,186.8
No. quest. returned	42	—	—	—	—	—	—	—	—	—	—
No. replied	37	35	32	32	33	36	16	31	30	28	39
No. not replied	4	6	9	9	8	5	25	10	11	13	2
% of dentists responding	3.9	4.2	3.9	3.7	3.7	4.1	4.6	3.7	3.9	3.3	3.8
15,000–24,999											
Sum per dentist	1,733.8	422.1	171.7	2,813.6	2,217.9	4,045.1	478.0	1,192.5	746.7	1,832.1	13,070.8
No. quest. returned	61	—	—	—	—	—	—	—	—	—	—
No. replied	55	48	48	52	57	53	23	50	46	49	60
No. not replied	6	13	13	9	4	8	38	11	15	12	1
% of dentists responding	5.9	5.8	5.9	6.1	6.5	6.0	6.6	6.0	6.1	5.8	5.9

TABLE A9 (Continued)

Average Expenditures by Specified Items of Professional Expense

(b) ACCORDING TO CITY SIZE *(continued)*

Size of city	Office rent	Utilities	Insurance office	Commercial charges	Dental supplies and drugs	Salaries	Fringe benefits	Travel expenses	Depreciation on equip.	Other expenses	Total
25,000–29,999											
Sum per dentist	1,334.1	342.0	324.5	4,164.5	2,262.5	5,459.3	114.0	415.9	851.5	3,130.1	18,222.3
No. quest. returned	11	—	—	—	—	—	—	—	—	—	—
No. replied	10	7	6	8	8	8	2	7	8	9	11
No. not replied	1	4	5	3	3	3	9	4	3	2	—
% of dentists responding	1.1	.8	.7	.9	.9	.9	.6	.8	1.1	1.1	1.1
30,000–49,999											
Sum per dentist	1,715.5	467.3	446.5	3,862.9	3,647.8	4,869.9	197.7	636.7	1,079.8	2,297.8	17,328.7
No. quest. returned	80	—	—	—	—	—	—	—	—	—	—
No. replied	75	69	66	72	73	72	29	64	61	66	78
No. not replied	5	11	14	8	7	8	51	16	19	14	2
% of dentists responding	8.0	8.3	8.1	8.4	8.3	8.2	8.4	7.7	8.0	7.8	7.7
50,000–99,999											
Sum per dentist	2,020.3	483.8	288.7	3,966.3	3,076.7	5,403.3	248.6	510.6	1,112.8	2,045.3	17,249.7
No. quest. returned	175	—	—	—	—	—	—	—	—	—	—
No. replied	149	137	126	137	138	146	63	133	132	140	162
No. not replied	26	38	49	38	37	29	112	42	43	35	13
% of dentists responding	15.9	16.5	15.5	16.0	15.6	16.5	18.2	16.0	17.4	16.6	15.9

TABLE A9 (Continued)

Average Expenditures by Specified Items of Professional Expense

(b) According to City Size *(continued)*

Size of city	Office rent	Utilities	Insurance office	Commercial charges	Dental supplies and drugs	Salaries	Fringe benefits	Travel expenses	Depreciation on equip.	Other expenses	Total
100,000–249,999											
Sum per dentist	1,914.3	446.5	414.5	3,673.7	2,413.8	5,317.1	130.9	543.7	839.0	1,871.9	16,600.7
No. quest. returned	90	—	—	—	—	—	—	—	—	—	—
No. replied	74	66	65	72	73	71	27	69	57	66	80
No. not replied	16	24	25	18	17	19	63	21	33	24	10
% of dentists responding	7.9	7.9	8.0	8.4	8.3	8.0	7.8	8.3	7.5	7.8	7.9
250,000–499,999											
Sum per dentist	2,350.6	462.9	409.3	3,367.0	2,976.4	5,607.9	257.3	695.2	1,235.7	2,013.5	17,919.2
No. quest. returned	116	—	—	—	—	—	—	—	—	—	—
No. replied	96	84	88	86	88	96	40	89	77	86	106
No. not replied	20	32	28	30	28	20	76	27	39	30	10
% of dentists responding	10.2	10.1	10.8	10.0	10.0	10.9	11.5	10.7	10.1	10.2	10.4
500,000 and over											
Sum per dentist	2,151.1	564.4	313.6	4,237.0	2,251.7	5,563.6	292.4	482.9	1,156.5	1,830.1	17,129.1
No. quest. returned	378	—	—	—	—	—	—	—	—	—	—
No. replied	316	273	275	281	296	283	99	275	246	281	344
No. not replied	62	105	103	97	82	95	279	103	132	97	34
% of dentists responding	33.7	32.8	33.8	32.8	33.5	32.1	28.5	33.0	32.3	33.4	33.8

TABLE A10

Professional Expenses as Percentage of Total Expenses by Specified Item

(a) According to County

County	Office rent	Utilities	Insurance office	Commercial charges	Dental supplies and drugs	Salaries	Fringe benefits	Travel expenses	Depreciation on equip.	Other expenses	Total
Algoma	8.9	2.1	1.3	27.1	12.9	24.2	2.1	4.4	4.3	12.7	100.
Brant	10.7	3.0	3.7	26.3	19.1	23.4	1.1	1.8	9.0	5.1	100.
Bruce	6.8	2.0	.7	28.4	19.4	30.0	.4	3.3	3.6	5.3	100.
Carleton	12.7	2.4	2.4	16.4	13.9	31.1	1.4	3.9	5.4	10.3	100.
Cochrane	8.1	2.6	1.0	33.1	20.0	20.3	.7	3.3	1.9	9.1	100.
Dufferin	10.5	3.3	1.0	26.8	16.1	24.1	.8	2.6	8.3	6.5	100.
Dundas	8.4	3.5	—	62.9	—	19.1	.2	—	3.4	2.5	100.
Durham	8.8	3.0	1.2	19.2	20.8	22.0	—	4.8	5.2	15.0	100.
Elgin	7.1	2.2	1.8	24.1	18.2	22.1	1.3	3.2	6.4	13.6	100.
Essex	11.0	2.1	1.0	20.5	16.3	31.4	1.1	2.9	4.4	9.3	100.
Frontenac	11.0	1.6	.8	19.2	14.9	28.7	1.0	7.6	3.3	11.9	100.
Glengarry	5.7	2.3	.3	29.0	12.8	26.1	—	1.0	3.3	19.4	100.
Grenville	12.0	3.3	3.3	32.0	14.7	28.0	—	2.7	—	4.0	100.
Grey	7.3	2.3	.9	21.9	17.2	29.4	.7	2.2	6.3	11.7	100.
Haldimand	—	—	—	—	—	—	—	—	—	—	—
Haliburton	—	—	—	—	—	—	—	—	—	—	—
Halton	11.0	3.0	1.3	18.3	22.9	24.3	.8	2.0	6.6	9.8	100.
Hastings	7.2	3.4	7.5	16.8	22.4	24.4	1.3	1.9	6.4	9.0	100.
Huron	12.2	3.1	1.0	15.5	24.5	26.8	.6	3.0	6.9	6.4	100.
Kenora	15.7	.6	1.3	14.4	17.0	21.4	.8	7.4	5.6	16.0	100.
Kent	6.0	3.0	1.3	32.9	15.9	20.6	1.6	2.4	6.3	9.9	100.
Lambton	11.0	3.2	2.7	24.2	30.7	15.5	.3	2.2	4.7	5.5	100.

TABLE A10 (Continued)

Professional Expenses as Percentage of Total Expenses by Specified Item

(a) According to County *(continued)*

County	Office rent	Utilities	Insurance office	Commercial charges	Dental supplies and drugs	Salaries	Fringe benefits	Travel expenses	Depreciation on equip.	Other expenses	Total
Lanark	6.5	4.4	1.6	22.6	13.4	30.6	.6	1.2	11.4	7.6	100.
Leeds	8.4	2.3	.5	15.8	12.3	51.4	1.0	1.7	4.0	2.6	100.
Lennox-Addington	14.2	7.9	—	—	—	77.9	—	—	—	—	100.
Lincoln	13.7	2.7	1.3	17.2	13.2	29.4	2.2	3.6	5.3	11.4	100.
Manitoulin	—	—	—	—	—	—	—	—	—	—	—
Middlesex	11.1	3.0	2.3	20.2	13.0	28.6	.8	3.7	5.0	12.2	100.
Muskoka	8.8	2.4	.3	19.4	15.4	39.8	.6	2.2	2.2	8.9	100.
Nipissing	8.2	2.0	.8	23.6	14.2	25.3	8.1	3.3	2.1	12.4	100.
Norfolk	8.3	2.6	1.0	24.0	12.3	29.5	.1	2.5	9.0	10.8	100.
Northumberland	4.9	1.3	.5	29.9	16.6	29.3	1.3	3.5	5.9	6.8	100.

(b) According to City Size

Under 1,000	4.1	4.1	.9	36.1	18.2	23.8	.3	4.1	.8	7.5	100.
1,000 – 2,499	9.2	3.5	1.5	27.2	13.8	24.2	.8	2.9	6.2	10.7	100.
2,500 – 4,999	7.9	2.8	1.0	23.6	16.9	27.8	1.0	2.7	6.3	10.0	100.
5,000 – 9,999	8.8	2.7	1.8	19.5	15.6	29.2	3.5	3.4	6.1	9.4	100.
10,000 – 14,999	7.6	2.3	1.1	24.4	17.3	25.0	.8	2.5	8.5	10.6	100.
15,000 – 24,999	11.0	2.7	1.1	17.9	14.1	25.7	3.0	7.6	4.7	11.6	100.
25,000 – 29,999	7.3	1.9	1.8	22.6	12.3	29.7	.6	2.3	4.6	17.0	100.
30,000 – 49,999	8.9	2.4	2.3	20.1	19.0	25.3	1.0	3.3	5.6	12.0	100.
50,000 – 99,999	10.5	2.5	1.5	20.7	16.1	28.2	1.3	2.6	5.8	10.7	100.
100,000 – 249,999	10.9	2.5	2.4	20.9	13.7	30.3	.7	3.1	4.8	10.7	100.
250,000 – 499,999	12.1	2.4	2.1	17.4	15.4	28.9	1.3	3.6	6.4	10.4	100.
500,000 and over	11.4	3.0	1.7	22.5	11.9	29.5	1.6	2.6	6.1	9.7	100.

TABLE A11

Percentage of Dentists Employing Specified Number and Type of Auxiliary Personnel

Number of Employees		Type of Personnel			
Full Time	Part Time	Hygienists %	Technicians %	Assistants %	Secretary-receptionists %
0	0	86.7	93.6	8.9	71.3
0	1	7.4	2.0	3.9	6.5
0	2	.1	.1	.7	.1
0	3+	.1	—	.3	.1
1	0	5.4	3.5	60.1	19.6
1	1	—	.1	11.2	.8
1	2	—	—	.6	—
1	3+	—	—	.2	—
2	0	—	.4	9.7	1.2
2	1	—	—	2.1	—
2	2	—	—	.4	.1
2	3+	—	—	.1	—
3	0	—	—	.9	—
3	1	—	—	.1	—
3	2	—	—	—	—
3	3+	—	—	.1	—
4	0	—	—	.3	—
4	1	—	—	—	—
4	2	—	—	—	—
4	3+	—	—	—	—
5+	0	—	—	.2	—
5+	1	—	—	—	—
5+	2	—	—	—	—
5+	3+	—	—	—	—
Not stated		.4	.4	.4	.4
		100	100	100	100

TABLE A12

Percentage of Dentists Employing Auxiliary Personnel, by Type of Personnel

(a) According to County

County	Type of personnel							
	Hygienists		Technicians		Assistants		Secretary-receptionists	
	Full time	Part time	Full time	Part time	Full time	Part time	Full time	Part time
	%	%	%	%	%	%	%	%
Algoma	—	7.1	—	—	85.7	14.3	7.1	7.1
Brant	—	14.3	—	—	71.4	—	—	14.3
Bruce	—	—	—	—	100.0	—	25.0	—
Carleton	1.4	2.8	5.6	—	93.1	12.5	41.7	16.7
Cochrane	—	—	—	—	100.0	—	—	28.6
Dufferin	—	—	—	—	100.0	—	—	33.3
Dundas	—	—	—	—	100.0	—	—	—
Durham	—	—	—	—	75.0	25.0	25.0	—
Elgin	—	7.1	—	—	92.9	7.1	21.4	14.3
Essex	3.5	3.5	—	10.4	79.3	13.8	24.1	10.4
Frontenac	6.3	12.5	6.3	—	87.5	25.0	25.0	12.5
Glengarry	—	—	—	—	100.0	—	—	100.0
Grenville	—	—	—	—	100.0	—	—	—
Grey	—	—	—	—	85.7	28.6	14.3	—
Haldimand	—	—	—	—	100.0	—	—	—
Haliburton	—	—	—	—	—	—	—	—
Halton	3.1	12.5	9.4	—	90.6	18.8	34.4	—
Hastings	27.3	9.1	—	—	100.0	36.4	36.4	9.1
Huron	—	—	—	25.0	100.0	—	—	—
Kenora	—	—	—	—	100.0	33.3	—	—
Kent	—	7.1	—	—	85.7	—	—	7.1
Lambton	9.1	9.1	—	—	90.9	18.2	54.5	27.3
Lanark	—	—	—	—	66.7	—	—	33.3
Leeds	—	—	—	—	100.0	—	—	33.3
Lennox-Addington	—	—	—	—	100.0	100.0	—	—
Lincoln	8.3	—	—	—	91.7	25.0	37.5	20.8
Manitoulin	—	—	—	—	—	—	—	—
Middlesex	6.5	21.7	2.2	—	84.8	34.8	17.4	10.9
Muskoka	—	33.3	—	—	100.0	—	33.3	—
Nipissing	—	—	—	—	100.0	—	20.0	—
Norfolk	—	—	—	—	87.5	12.5	37.5	—
Northumberland	—	—	—	—	100.0	—	40.0	—
Ontario	17.4	—	4.4	4.4	87.0	21.7	21.7	—
Oxford	—	7.7	7.7	—	92.3	—	61.5	7.7
Parry Sound	—	—	—	—	40.0	20.0	—	—
Peel	—	5.6	—	—	95.5	13.6	31.8	4.6
Perth	—	—	—	—	83.3	—	16.7	—
Peterborough	—	6.7	—	—	73.3	26.7	40.0	—
Prescott	—	—	—	—	50.0	—	—	—
Prince Edward	—	—	—	—	100.0	—	100.0	—

TABLE A12 (Continued)

Percentage of Dentists Employing Auxiliary Personnel, by Type of Personnel

(a) According to County *(continued)*

County	Type of personnel							
	Hygienists		Technicians		Assistants		Secretary-receptionists	
	Full time	Part time	Full time	Part time	Full time	Part time	Full time	Part time
	%	%	%	%	%	%	%	%
Rainy River	—	—	—	—	100.0	—	—	—
Renfrew	—	7.7	7.7	—	92.3	30.8	—	—
Russell	—	—	—	—	—	—	—	—
Simcoe	4.8	4.8	—	—	95.2	9.5	52.4	—
Stormont	16.7	—	—	—	100.0	—	83.3	—
Sudbury	—	9.5	4.8	9.5	95.2	28.6	23.8	9.5
Thunder Bay	4.6	13.6	4.6	—	90.9	22.7	4.6	4.6
Timiskaming	16.7	—	—	16.7	100.0	16.7	16.7	—
Victoria	—	—	—	—	100.0	33.3	—	—
Waterloo	11.4	15.9	4.6	2.3	84.1	9.1	25.0	9.1
Welland	4.2	8.3	4.2	12.5	83.3	25.0	25.0	4.2
Wellington	—	7.7	7.7	7.7	92.3	23.1	23.1	7.7
Wentworth	1.7	3.3	3.3	1.7	88.3	15.0	20.0	1.7
York	7.3	8.6	5.1	2.5	80.8	24.1	14.2	6.8
Military bases	—	—	50.0	—	50.0	50.0	50.0	—
Not stated	8.7	—	—	—	87.0	17.4	21.7	8.7

(b) By City Size

City size	Type of personnel							
	Hygienists		Technicians		Assistants		Secretary-receptionists	
	Full time	Part time	Full time	Part time	Full time	Part time	Full time	Part time
	%	%	%	%	%	%	%	%
Under 1,000	—	—	—	—	80.0	20.0	—	—
1,000 – 2,499	4.0	4.0	—	4.0	80.0	24.0	4.0	4.0
2,500 – 4,999	1.8	7.3	—	5.5	89.1	16.4	16.4	7.3
5,000 – 9,999	—	3.2	1.6	—	87.1	14.5	17.7	9.7
10,000 – 14,999	4.9	2.4	2.4	2.4	90.2	19.5	26.8	—
15,000 – 24,999	3.3	1.6	3.3	1.6	95.1	13.1	36.1	6.6
25,000 – 29,999	—	9.1	—	—	100.0	9.1	18.2	18.2
30,000 – 49,999	6.3	11.3	3.8	3.8	90.0	18.8	23.8	7.5
50,000 – 99,999	6.3	8.6	5.1	2.3	89.1	18.9	30.3	7.4
100,000 – 249,999	5.6	12.2	5.6	2.2	83.3	26.7	21.1	12.2
250,000 – 499,999	1.7	4.3	3.5	—	89.7	13.8	31.0	10.4
500,000 and over	7.9	8.7	4.8	2.4	80.4	22.2	14.6	6.4
Not stated	—	—	—	—	50.0	—	50.0	—

TABLE A12 (Continued)

Percentage of Dentists Employing Auxiliary Personnel, by Type of Personnel

(c) By Age

Age	Type of personnel							
	Hygienists		Technicians		Assistants		Secretary-receptionists	
	Full time	Part time	Full time	Part time	Full time	Part time	Full time	Part time
	%	%	%	%	%	%	%	%
Under 25	9.5	—	—	—	76.2	23.8	28.6	4.8
25 – 29	2.5	6.9	.6	.6	86.9	20.6	24.4	5.6
30 – 34	3.3	10.4	3.9	1.1	90.1	20.9	24.7	8.2
35 – 39	7.6	12.7	7.0	4.5	95.5	21.0	27.4	5.1
40 – 44	10.4	9.8	5.2	2.9	91.3	19.7	23.7	16.2
45 – 49	5.5	4.7	3.9	2.3	88.3	21.1	25.0	7.0
50 – 54	3.1	7.8	4.7	1.6	87.5	23.4	12.5	3.1
55 – 59	4.1	6.1	4.1	6.1	83.7	18.4	18.4	10.2
60 – 64	3.9	—	—	—	71.2	11.5	11.5	3.9
65 – 69	—	—	3.1	1.6	65.6	6.3	7.8	1.6
70 – 74	6.3	6.3	3.1	3.1	50.0	15.6	3.1	3.1
75 and over	—	—	—	—	57.1	28.6	14.3	—
Not stated	—	—	16.7	—	75.0	25.0	25.0	16.7

(d) By Year of Graduation

Year of graduation	Type of personnel							
	Hygienists		Technicians		Assistants		Secretary-receptionists	
	Full time	Part time	Full time	Part time	Full time	Part time	Full time	Part time
	%	%	%	%	%	%	%	%
1960 to present	3.3	8.0	2.0	1.0	87.0	23.3	21.9	7.0
1950 – 1959	6.1	9.5	4.1	2.2	92.0	18.9	27.4	9.0
1940 – 1949	8.5	7.8	7.0	4.9	88.7	24.7	21.8	9.9
1930 – 1939	5.6	5.6	3.4	3.4	85.4	12.4	14.6	9.0
1920 – 1929	2.7	1.8	1.8	1.8	61.1	8.9	8.9	.9
1910 – 1919	5.6	—	5.6	—	61.1	27.8	11.1	5.6
1900 – 1909	—	100.0	—	—	100.0	—	—	—
Not stated	12.0	4.0	16.0	—	84.0	20.0	16.0	4.0

TABLE A13

Number of Hours per Week Spent in Dental Office, by Type of Office Activity

(a) By County

County	Total	Type of activity		
		Chairside	Laboratory	Other
Algoma				
Hours per dentist	36.7	30.4	3.1	2.6
No. quest. returned	14	14	14	14
No. replied	14	14	14	13
No. not replied	0	0	0	1
% replied	1.3	1.4	1.9	1.4
Brant				
Hours per dentist	35.7	30.9	2.6	2.3
No. quest. returned	7	7	7	7
No. replied	7	7	4	5
No. not replied	0	0	3	2
% replied	.7	.7	.5	.6
Bruce				
Hours per dentist	38.0	26.8	2.3	3.0
No. quest. returned	4	4	4	4
No. replied	4	3	—	3
No. not replied	—	1	1	1
% replied	.4	.3	.4	.3
Carleton				
Hours per dentist	39.4	32.9	1.4	3.2
No. quest. returned	72	72	72	72
No. replied	70	66	42	59
No. not replied	2	6	30	13
% replied	6.6	6.4	5.7	6.5
Cochrane				
Hours per dentist	41.1	33.3	4.3	3.6
No. quest. returned	7	7	7	7
No. replied	7	7	7	6
No. not replied	—	—	—	1
% replied	.7	.7	.9	.7
Dufferin				
Hours per dentist	39.3	33.3	3.7	2.0
No. quest. returned	3	3	3	3
No. replied	3	3	3	3
No. not replied	—	—	—	—
% replied	.3	.3	.4	.3
Durham				
Hours per dentist	42.0	35.8	2.5	3.8
No. quest. returned	4	4	4	4
No. replied	4	4	4	4
No. not replied	—	—	—	—
% replied	.4	.4	.5	.4

TABLE A13 (Continued)

Number of Hours per Week Spent in Dental Office, by Type of Office Activity

(a) By County *(continued)*

County	Total	Type of activity		
		Chairside	Laboratory	Other
Elgin				
Hours per dentist	41.6	32.4	5.6	3.6
No. quest. returned	14	14	14	14
No. replied	14	14	11	12
No. not replied	—	—	3	2
% replied	1.3	1.4	1.5	1.3
Essex				
Hours per dentist	37.6	29.7	2.4	2.5
No. quest. returned	29	29	29	29
No. replied	29	26	21	23
No. not replied	—	3	8	6
% replied	2.7	2.5	2.8	2.5
Frontenac				
Hours per dentist	37.9	31.4	1.8	2.4
No. quest. returned	16	16	16	16
No. replied	16	15	10	12
No. not replied	—	1	6	4
% replied	1.5	1.5	1.4	1.3
Grey				
Hours per dentist	42.2	36.5	3.7	2.0
No. quest. returned	7	7	7	7
No. replied	6	6	6	6
No. not replied	1	1	1	1
% replied	.6	.6	.8	.7
Halton				
Hours per dentist	40.6	34.5	2.2	3.9
No. quest. returned	32	32	32	32
No. replied	32	32	23	29
No. not replied	—	—	9	3
% replied	3.0	3.1	3.1	3.2
Hastings				
Hours per dentist	43.5	36.4	2.9	4.3
No. quest. returned	11	11	11	11
No. replied	11	11	10	11
No. not replied	—	—	1	—
% replied	1.0	1.1	1.4	1.2
Huron				
Hours per dentist	44.3	38.3	3.3	3.3
No. quest. returned	4	4	4	4
No. replied	4	4	4	3
No. not replied	—	—	—	1
% replied	.4	.4	.5	.3

TABLE A13 (Continued)
Number of Hours per Week Spent in Dental Office, by Type of Office Activity

(a) By County *(continued)*

County	Total	Type of activity		
		Chairside	Laboratory	Other
KENORA				
Hours per dentist	40.7	32.7	2.7	2.3
No. quest. returned	3	3	3	3
No. replied	3	3	3	3
No. not replied	—	—	—	—
% replied	.3	.3	.4	.3
KENT				
Hours per dentist	41.4	33.0	2.9	3.4
No. quest. returned	14	14	14	14
No. replied	14	14	8	12
No. not replied	—	—	6	2
% replied	1.3	1.4	1.1	1.3
LAMBTON				
Hours per dentist	41.4	36.0	2.1	3.3
No. quest. returned	11	11	11	11
No. replied	11	11	9	10
No. not replied	—	—	2	1
% replied	1.0	1.1	1.2	1.1
LANARK				
Hours per dentist	38.3	34.7	2.3	1.3
No. quest. returned	3	3	3	3
No. replied	3	3	2	1
No. not replied	—	—	1	2
% replied	.3	.3	.3	.1
LEEDS				
Hours per dentist	40.7	36.0	2.7	2.0
No. quest. returned	3	3	3	3
No. replied	3	3	3	3
No. not replied	—	—	—	—
% replied	.3	.3	.4	.3
LINCOLN				
Hours per dentist	39.3	34.8	1.3	3.2
No. quest. returned	24	24	24	24
No. replied	23	23	12	18
No. not replied	1	1	12	6
% replied	2.2	2.2	1.6	2.0
MIDDLESEX				
Hours per dentist	40.4	36.2	2.1	3.2
No. quest. returned	46	46	46	46
No. replied	45	45	34	40
No. not replied	1	1	12	6
% replied	4.3	4.4	4.6	4.4

TABLE A13 (Continued)

Number of Hours per Week Spent in Dental Office, by Type of Office Activity

(a) By County *(continued)*

Muskoka				
Hours per dentist	37.3	35.0	1.3	1.0
No. quest. returned	3	3	3	3
No. replied	3	3	3	2
No. not replied	—	—	—	1
% replied	.3	.3	.4	.2
Nipissing				
Hours per dentist	39.3	34.6	1.7	3.0
No. quest. returned	10	10	10	10
No. replied	10	10	6	10
No. not replied	—	—	4	—
% replied	.9	1.0	.8	1.1
Norfolk				
Hours per dentist	35.6	32.5	2.0	1.1
No. quest. returned	8	8	8	8
No. replied	8	8	6	5
No. not replied	—	—	2	3
% replied	.8	.8	.8	.6
Northumberland				
Hours per dentist	44.2	39.0	1.0	4.2
No. quest. returned	5	5	5	5
No. replied	5	5	3	5
No. not replied	—	—	2	—
% replied	.5	.5	.4	.6
Ontario				
Hours per dentist	41.0	34.0	1.3	4.8
No. quest. returned	23	23	23	23
No. replied	22	21	14	21
No. not replied	1	2	9	2
% replied	2.1	2.0	1.9	2.3
Oxford				
Hours per dentist	38.4	33.3	2.2	2.8
No. quest. returned	13	13	13	13
No. replied	13	13	10	10
No. not replied	—	—	3	3
% replied	1.2	1.3	1.4	1.1
Parry Sound				
Hours per resident	42.6	37.0	2.6	3.0
No. quest. returned	5	5	5	5
No. replied	5	5	5	4
No. not replied	—	—	—	1
% replied	.5	.5	.7	.4

TABLE A13 (Continued)
Number of Hours per Week Spent in Dental Office, by Type of Office Activity

(a) By County *(continued)*

County	Total	Type of activity		
		Chairside	Laboratory	Other
Peel				
Hours per dentist	43.6	37.5	2.4	3.6
No. quest. returned	22	22	22	22
No. replied	22	22	17	21
No. not replied	—	—	5	1
% replied	2.1	2.1	2.3	2.3
Perth				
Hours per dentist	45.0	34.8	6.6	3.6
No. quest. returned	6	6	6	6
No. replied	5	5	5	5
No. not replied	1	1	1	1
% replied	.5	.5	.7	.6
Peterborough				
Hours per dentist	39.9	35.4	1.8	2.7
No. quest. returned	15	15	15	15
No. replied	15	15	10	13
No. not replied	—	—	5	2
% replied	1.4	1.5	1.4	1.4
Prescott				
Hours per dentist	84	25.0	4.0	.5
No. quest. returned	2	2	2	2
No. replied	2	1	1	1
No. not replied	—	1	1	1
% replied	.2	.1	.1	.1
Renfrew				
Hours per dentist	37.9	26.5	2.5	5.2
No. quest. returned	13	13	13	13
No. replied	13	12	11	10
No. not replied	—	1	2	3
% replied	1.2	1.2	1.5	1.1
Simcoe				
Hours per dentist	40.9	35.2	2.0	3.6
No. quest. returned	21	21	21	21
No. replied	21	21	17	20
No. not replied	—	—	4	1
% replied	2.0	2.0	2.3	2.2
Stormont				
Hours per dentist	42.2	34.5	4.5	3.2
No. quest. returned	6	6	6	6
No. replied	6	6	5	6
No. not replied	—	—	1	—
% replied	.6	.6	.7	.7

TABLE A13 (Continued)

Number of Hours per Week Spent in Dental Office, by Type of Office Activity

(a) By County *(continued)*

County	Total	Type of activity		
		Chairside	Laboratory	Other
Sudbury				
Hours per dentist	40.7	35.8	2.5	2.4
No. quest. returned	21	21	21	21
No. replied	20	20	17	21
No. not replied	1	1	4	—
% replied	1.9	1.9	2.3	2.3
Thunder Bay				
Hours per dentist	37.3	31.1	2.7	3.4
No. quest. returned	22	22	22	22
No. replied	22	22	14	19
No. not replied	—	—	8	3
% replied	2.1	2.1	1.9	2.1
Timiskaming				
Hours per dentist	39.0	33.8	2.8	2.3
No. quest. returned	6	6	6	6
No. replied	6	6	6	6
No. not replied	—	—	—	—
% replied	.6	.6	.8	.7
Victoria				
Hours per dentist	52.3	44.7	5.3	2.3
No. quest. returned	3	3	3	3
No. replied	3	3	3	2
No. not replied	—	—	—	1
% replied	.3	.3	.4	.2
Waterloo				
Hours per dentist	39.0	34.2	2.0	2.7
No. quest. returned	44	44	44	44
No. replied	43	43	29	36
No. not replied	1	1	15	8
% replied	4.1	4.2	3.9	4.0
Welland				
Hours per dentist	40.9	33.1	3.0	2.8
No. quest. returned	24	24	24	24
No. replied	24	23	18	20
No. not replied	—	1	6	4
% replied	2.3	2.2	2.4	2.2
Wellington				
Hours per dentist	38.0	32.9	1.7	3.0
No. quest. returned	13	13	13	13
No. replied	13	13	9	13
No. not replied	—	—	4	—
% replied	1.2	1.3	1.2	1.4

TABLE A13 (Continued)

Number of Hours per Week Spent in Dental Office, by Type of Office Activity

(a) By County *(continued)*

County	Total	Type of activity		
		Chairside	Laboratory	Other
Wentworth				
Hours per dentist	41.4	34.5	2.8	3.0
No. quest. returned	60	60	60	60
No. replied	59	58	42	50
No. not replied	1	2	18	10
% replied	5.6	5.6	5.7	5.5
York				
Hours per dentist	40.2	33.9	1.8	3.4
No. quest. returned	395	395	395	395
No. replied	386	376	251	327
No. not replied	9	19	144	68
% replied	36.5	36.3	33.8	35.9
Military Bases				
Hours per dentist	40.5	38.0	1.5	1.0
No. quest. returned	2	2	2	2
No. replied	2	2	1	1
No. not replied	—	—	1	1
% replied	.2	.2	.1	.1

(b) According to City Size

City size	Total	Type of activity		
		Chairside	Laboratory	Other
Under 1,000				
Hours per dentist	36.8	28.0	6.8	2.0
No. quest. returned	5	5	5	5
No. replied	5	5	4	3
No. not replied	—	—	1	2
% replied	.5	.5	.5	.3
1,000–2,499				
Hours per dentist	39.7	32.1	3.0	2.4
No. quest. returned	25	25	25	25
No. replied	24	22	21	19
No. not replied	1	3	4	6
% replied	2.2	2.1	2.8	2.1
2,500–4,999				
Hours per dentist	40.2	34.7	3.0	2.7
No. quest. returned	55	55	55	55
No. replied	53	53	48	48
No. not replied	2	2	7	7
% replied	4.9	5.0	6.4	5.2

TABLE A13 (Continued)

Number of Hours per Week Spent in Dental Office, by Type of Office Activity

(b) According to City Size *(continued)*

City size	Total	Type of activity		
		Chairside	Laboratory	Other
5,000–9,999				
Hours per dentist	41.3	34.0	3.0	2.8
No. quest. returned	62	62	62	62
No. replied	61	59	51	50
No. not replied	1	3	11	12
% replied	5.7	5.6	6.8	5.4
10,000–14,999				
Hours per dentist	42.3	36.3	2.5	3.5
No. quest. returned	41	41	41	41
No. replied	41	41	31	34
No. not replied	—	—	10	7
% replied	3.8	3.9	4.1	3.7
15,000–24,999				
Hours per dentist	39.7	31.5	3.8	3.5
No. quest. returned	61	61	61	61
No. replied	60	59	53	51
No. not replied	1	2	8	10
% replied	5.6	5.6	7.0	5.5
25,000–29,999				
Hours per dentist	40.5	34.5	3.0	3.1
No. quest. returned	11	11	11	11
No. replied	11	11	9	7
No. not replied	—	—	2	4
% replied	1.0	1.0	1.2	.8
30,000–49,999				
Hours per dentist	40.0	33.8	2.4	3.3
No. quest. returned	80	80	80	80
No. replied	80	80	56	74
No. not replied	—	—	24	6
% replied	7.4	7.6	7.4	8.0
50,000–99,999				
Hours per dentist	39.6	34.0	1.8	2.9
No. quest. returned	175	175	175	175
No. replied	172	168	116	148
No. not replied	3	7	59	27
% replied	15.9	15.9	15.4	16.1
100,000–249,999				
Hours per dentist	39.7	34.3	1.8	3.2
No. quest. returned	90	90	90	90
No. replied	89	86	62	78
No. not replied	1	4	28	12
% replied	8.3	8.2	8.2	8.5

TABLE A13 (Continued)

Number of Hours per Week Spent in Dental Office, by Type of Office Activity

(b) According to City Size *(continued)*

City size	Total	Type of activity		
		Chairside	Laboratory	Other
250,000–499,999				
Hours per dentist	40.2	34.1	2.0	3.2
No. quest. returned	116	116	116	116
No. replied	113	110	70	96
No. not replied	3	6	46	20
% replied	10.5	10.4	9.3	10.4
500,000 and over				
Hours per dentist	40.0	33.7	1.7	3.5
No. quest. returned	378	378	378	378
No. replied	370	360	234	314
No. not replied	8	18	144	64
% replied	34.3	34.2	31.0	34.1

(c) According to Age

Age	Total	Type of activity		
		Chairside	Laboratory	Other
Under 25				
Hours per dentist	42.9	36.0	2.3	4.6
No. quest. returned	21	21	21	21
No. replied	21	21	17	19
No. not replied	—	—	4	2
% replied	2.0	2.0	2.3	2.1
25–29				
Hours per dentist	41.3	35.7	1.9	3.8
No. quest. returned	160	160	160	160
No. replied	156	156	115	146
No. not replied	4	4	45	4
% replied	14.6	14.9	15.3	15.9
30–34				
Hours per dentist	40.0	34.4	1.7	3.3
No. quest. returned	182	182	182	182
No. replied	180	179	134	160
No. not replied	2	3	48	22
% replied	16.8	17.1	17.9	17.4
35–39				
Hours per dentist	41.4	35.9	2.0	3.3
No. quest. returned	157	157	157	157
No. replied	155	155	114	147
No. not replied	2	2	43	10
% replied	14.5	14.8	15.2	16.0

TABLE A13 (Continued)

Number of Hours per Week Spent in Dental Office, by Type of Office Activity

(c) ACCORDING TO AGE *(continued)*

Age	Total	Type of activity		
		Chairside	Laboratory	Other
40–44				
Hours per dentist	40.6	34.9	1.7	3.4
No. quest. returned	173	173	173	173
No. replied	172	170	111	155
No. not replied	1	1	62	18
% replied	16.1	16.2	14.8	16.9
45–49				
Hours per dentist	40.9	76.0	1.9	3.2
No. quest. returned	128	128	128	128
No. replied	126	123	86	109
No. not replied	2	5	42	19
% replied	11.8	11.7	11.5	11.9
50–54				
Hours per dentist	38.5	33.3	2.1	2.7
No. quest. returned	64	64	64	64
No. replied	63	61	40	49
No. not replied	1	3	24	15
% replied	5.9	5.8	5.3	5.3
55–59				
Hours per dentist	41.6	33.6	2.9	2.8
No. quest. returned	49	49	49	49
No. replied	49	46	34	39
No. not replied	—	3	15	10
% replied	4.6	4.4	4.5	4.3
60–64				
Hours per dentist	36.4	28.4	3.4	2.4
No. quest. returned	52	52	52	52
No. replied	49	45	32	35
No. not replied	3	7	20	17
% replied	4.6	4.3	4.3	3.8
65–69				
Hours per dentist	37.7	28.8	4.5	1.8
No. quest. returned	64	64	64	64
No. replied	63	59	46	37
No. not replied	1	5	18	27
% replied	5.9	5.6	6.1	4.0
70–74				
Hours per dentist	31.3	23.8	2.1	2.4
No. quest. returned	32	32	32	32
No. replied	29	27	16	18
No. not replied	3	5	16	14
% replied	2.7	2.6	2.1	2.0

TABLE A13 (Continued)

Number of Hours per Week Spent in Dental Office, by Type of Office Activity

(c) According to Age *(continued)*

Age	Total	Type of activity		
		Chairside	Laboratory	Other
75 and over				
Hours per dentist	35.0	28.5	4.3	2.2
No. quest. returned	7	7	7	7
No. replied	6	6	5	4
No. not replied	1	1	2	3
% replied	.6	.6	.7	.4

(d) According to Year of Graduation

Year of graduation	Total	Type of activity		
		Chairside	Laboratory	Other
1960 to present				
Hours per dentist	41.5	55.5	2.0	3.9
No. quest. returned	301	301	301	301
No. replied	296	294	225	273
No. not replied	5	7	76	28
% replied	28.0	28.4	30.3	30.2
1950–1959				
Hours per dentist	40.2	34.6	1.8	3.3
No. quest. returned	412	412	412	412
No. replied	410	405	284	367
No. not replied	2	7	128	45
% replied	38.7	39.2	38.2	40.6
1940–1949				
Hours per dentist	40.7	35.3	1.9	3.0
No. quest. returned	142	142	142	142
No. replied	139	137	89	120
No. not replied	3	5	53	22
% replied	13.1	13.3	12.0	13.3
1930–1939				
Hours per dentist	39.4	33.4	2.9	2.5
No. quest. returned	89	89	89	89
No. replied	89	86	61	67
No. not replied	—	3	28	22
% replied	8.4	8.3	8.2	7.4
1920–1929				
Hours per dentist	35.6	26.4	4.1	2.0
No. quest. returned	113	113	113	113
No. replied	105	95	73	63
No. not replied	8	18	40	50
% replied	9.9	9.2	9.8	7.0

TABLE A13 (Continued)

Number of Hours per Week Spent in Dental Office, by Type of Office Activity

(d) According to Year of Graduation *(continued)*

Year of graduation	Total	Type of activity		
		Chairside	Laboratory	Other
1910–1919				
Hours per dentist	34.7	25.7	2.3	3.6
No. quest. returned	18	18	18	18
No. replied	18	17	11	15
No. not replied	—	1	7	3
% replied	1.7	1.6	1.5	1.7
1900–1910	—	—	—	—
Before 1900	—	—	—	—

(e) According to Organization of Practice

Organization of practice	Total	Type of activity		
		Chairside	Laboratory	Other
Solo Practice				
Hours per dentist	40.2	34.0	2.2	3.1
No. quest. returned	898	898	898	898
No. replied	886	865	629	750
No. not replied	12	33	269	148
% replied	83.4	83.3	84.5	82.8
Sharing Costs				
Hours per dentist	39.7	33.1	2.1	3.6
No. quest. returned	151	151	151	151
No. replied	147	144	100	130
No. not replied	4	7	51	21
% replied	13.8	13.9	13.4	14.4
Partnership				
Hours per dentist	38.4	32.0	1.2	3.4
No. quest. returned	32	32	32	32
No. replied	30	29	15	26
No. not replied	2	3	17	6
% replied	2.8	2.8	2.0	2.9

TABLE A13 (Continued)

Number of Hours per Week Spent in Dental Office, by Type of Office Activity

(f) According to Type of Practice

Type of practice	Total	Type of activity		
		Chairside	Laboratory	Other
General Practitioner				
Hours per dentist	40.4	34.1	2.2	3.2
No. quest. returned	1,010	1,010	1,010	1,010
No. replied	994	971	721	854
No. not replied	16	39	289	156
% replied	85.5	85.3	91.4	86.0
Specialist				
Hours per dentist	36.7	31.0	1.3	3.6
No. quest. returned	85	85	85	85
No. replied	83	82	33	68
No. not replied	2	3	52	17
% replied	7.1	7.2	4.2	6.9
Oral Surgeon				
Hours per dentist	36.3	27.1	.4	4.5
No. quest. returned	16	16	16	16
No. replied	15	14	1	10
No. not replied	1	2	15	6
% replied	1.3	1.2	.1	1.0
Orthodontist				
Hours per dentist	38.0	32.4	2.0	3.7
No. quest. returned	35	35	35	35
No. replied	34	34	21	31
No. not replied	1	1	14	4
% replied	2.9	3.0	2.7	3.1
Periodontist				
Hours per dentist	32.7	28.3	.7	3.8
No. quest. returned	12	12	12	12
No. replied	12	12	3	11
No. not replied	—	—	9	1
% replied	1.0	1.1	.4	1.1
Other				
Hours per dentist	38.4	33.8	1.2	3.3
No. quest. returned	25	25	25	25
No. replied	25	25	10	19
No. not replied	—	—	15	6
% replied	2.2	2.2	1.3	1.9

TABLE A14

Number of Weeks per Year Worked in Dental Office

(a) By County

County	No. of questionnaires returned	Number replied	No. not replied	Percentage of responding dentists	Weeks worked per dentist
Algoma	14	13	1	1.23	46.2
Brant	7	7	—	.66	43.3
Bruce	4	3	1	.28	52.0
Carleton	72	72	—	6.79	46.9
Cochrane	7	7	—	.66	42.9
Dufferin	3	3	—	.28	46.3
Dundas	1	—	—	—	—
Durham	4	4	—	.38	48.8
Elgin	14	14	—	1.32	42.1
Essex	29	28	1	2.64	44.9
Frontenac	16	15	1	1.41	45.4
Glengarry	1	—	—	—	—
Grenville	1	—	—	—	—
Grey	7	6	1	.57	47.5
Haldimand	1	—	—	—	—
Haliburton	—	—	—	—	—
Halton	32	32	—	3.02	44.7
Hastings	11	11	—	1.04	41.3
Huron	4	4	—	.38	41.8
Kenora	3	3	—	.28	35.7
Kent	14	14	—	1.32	45.4
Lambton	11	10	1	.94	46.4
Lanark	3	3	—	.28	49.0
Leeds	3	3	—	.28	48.0
Lennox-Addington	1	—	—	—	—
Lincoln	24	24	—	2.26	46.0
Manitoulin	—	—	—	—	—
Middlesex	46	45	1	4.24	44.5
Muskoka	3	3	—	.28	48.3
Nipissing	10	10	—	.94	43.6
Norfolk	8	7	1	.66	42.0
Northumberland	5	5	—	.47	46.4
Ontario	23	22	1	2.07	46.6
Oxford	13	13	—	1.23	47.8
Parry Sound	5	5	—	.47	43.8
Peel	22	22	—	2.07	48.7
Perth	6	5	1	.47	46.6
Peterborough	15	15	—	1.41	44.8
Prescott	2	—	—	—	—
Prince Edward	1	—	—	—	50.0
Rainy River	1	—	—	—	38.0
Renfrew	13	13	—	1.23	46.3
Russell	1	—	—	—	—
Simcoe	21	21	—	1.98	46.8
Stormont	6	6	—	.57	47.2

TABLE A14 (Continued)

Number of Weeks per Year Worked in Dental Office

(a) By County *(continued)*

County	No. of questionnaires returned	Number replied	No. not replied	Percentage of responding dentists	Weeks worked per dentist
Sudbury	21	21	—	1.98	45.5
Thunder Bay	22	22	—	2.07	46.2
Timiskaming	6	6	—	.57	47.5
Victoria	3	3	—	.28	48.3
Waterloo	44	43	1	4.05	46.3
Welland	24	24	—	2.26	47.5
Wellington	13	13	—	1.23	47.3
Wentworth	60	59	1	5.56	45.4
York	395	390	5	36.76	46.2
Military Bases	2	2	—	.19	43.5

(b) By City Size

City size	No. of questionnaires returned	Number replied	No. not replied	Percentage of responding dentists	Weeks worked per dentist
Under 1,000	5	5	—	.46	43.2
1,000 – 2,499	25	24	1	2.22	42.6
2,500 – 4,999	55	54	1	5.00	44.7
5,000 – 9,999	62	62	—	5.74	44.7
10,000 – 14,999	41	40	1	3.70	46.4
15,000 – 24,999	61	60	1	5.55	46.2
25,000 – 29,999	11	11	—	1.02	46.2
30,000 – 49,999	80	80	—	7.40	46.0
50,000 – 99,999	175	171	4	15.82	45.9
100,000 – 249,999	90	88	2	8.14	46.3
250,000 – 499,999	116	115	1	10.64	46.6
500,000 and over	378	371	7	34.32	46.2

(c) According to Age

Age	No. of questionnaires returned	Number replied	No. not replied	Percentage of responding dentists	Weeks worked per dentist
Under 25	21	20	1	1.87	34.4
25 – 29	160	158	2	14.74	44.4
30 – 34	182	178	4	16.60	47.2
35 – 39	157	157	—	14.65	47.2
40 – 44	173	171	2	15.95	46.6
45 – 49	128	127	1	11.85	46.7
50 – 54	64	64	—	5.97	46.4
55 – 59	49	49	—	4.57	45.8
60 – 64	52	49	3	4.57	45.9
65 – 69	64	62	2	5.78	44.2
70 – 74	32	31	1	2.89	43.5
75 and over	7	6	1	.56	45.3

TABLE A14 (Continued)
Number of Weeks per Year Worked in Dental Office

(d) According to Year of Graduation

Year of graduation	No. of questionnaires returned	Number replied	No. not replied	Percentage of responding dentists	Weeks worked per dentist
1960 to present	301	295	5	27.98	44.6
1950 – 1959	412	410	2	38.75	47.0
1940 – 1949	142	140	2	13.23	47.1
1930 – 1939	89	87	2	8.22	45.5
1920 – 1929	113	107	6	10.11	44.5
1910 – 1919	18	18	—	1.70	44.1
1900 – 1910	—	—	—	—	—
Before 1900	—	—	—	—	—

(e) According to Organization of Practice

Organization of practice	No. of questionnaires returned	Number replied	No. not replied	Percentage of responding dentists	Weeks worked per dentist
Solo practice	898	883	15	82.91	46.0
Sharing costs	151	150	1	14.09	45.6
Partnership	32	32	—	3.01	45.8

(f) According to Type of Practice

Type of practice	No. of questionnaires returned	Number replied	No. not replied	Percentage of responding dentists	Weeks worked per dentist
Gen. practitioner	1,010	995	15	—	—
Specialist	85	84	1	—	—
Oral surgeon	16	16	—	—	—
Orthodontist	35	35	—	—	—
Periodontist	12	12	—	—	—
Other	25	24	1	—	—

TABLE A15

Hours Worked per Year, Gross Income per Chairside Hour, and Net Income per Hour Worked

(a) By County

County	No. of questionnaires returned	Number replied	No. not replied	Percentage of responding dentists	Hours worked per dentist	Gross income per chairside hour per dentist	Net income per chairside hour per dentist
Algoma	13	13	—	1.32	1,701	22.4	10.8
Brant	6	6	—	.61	1,477	21.7	11.7
Bruce	4	4	—	.41	1,455	12.2	10.1
Carleton	66	66	—	6.69	1,862	23.4	12.4
Cochrane	7	7	—	.71	1,757	23.3	10.9
Dufferin	3	3	—	.30	1,825	14.6	7.3
Durham	4	4	—	.41	2,054	16.5	6.7
Elgin	12	12	—	1.22	1,667	20.6	9.6
Essex	25	25	—	2.53	1,714	21.0	12.7
Frontenac	14	14	—	1.42	1,662	19.6	11.1
Grey	6	6	—	.61	2,001	14.5	6.5
Halton	32	32	—	3.24	1,809	21.6	10.0
Hastings	10	10	—	1.01	1,882	27.8	11.6
Huron	3	3	—	.30	2,189	14.6	7.5
Kent	13	13	—	1.32	2,035	18.4	8.8
Lambton	9	9	—	.91	1,977	23.6	10.9
Lanark	3	3	—	.30	1,888	15.0	6.3
Leeds	3	3	—	.30	1,952	22.5	10.7
Lincoln	22	22	—	2.23	1,854	23.6	11.5
Middlesex	41	41	—	4.15	1,862	21.5	10.7
Muskoka	3	3	—	.30	1,810	14.3	7.9
Nipissing	10	10	—	1.01	1,708	23.4	10.6

TABLE A15 (Continued)

Hours Worked per Year, Gross Income per Chairside Hour, and Net Income per Hour Worked

(a) By County *(continued)*

County	No. of questionnaires returned	Number replied	No. not replied	Percentage of responding dentists	Hours worked per dentist	Gross income per chairside hour per dentist	Net income per chairside hour per dentist
Norfolk	7	7	—	.71	1,689	21.5	11.7
Northumberland	5	5	—	.51	2,044	25.2	12.8
Ontario	21	21	—	2.13	1,903	25.1	12.3
Oxford	13	13	—	1.32	1,833	20.3	9.9
Parry Sound	5	5	—	.51	1,880	13.2	6.7
Peel	21	21	—	2.13	2,135	18.6	7.9
Perth	5	5	—	.51	2,095	18.5	7.4
Peterborough	15	15	—	1.52	1,794	18.2	8.8
Renfrew	13	13	—	1.32	1,757	18.3	9.3
Simcoe	20	20	—	2.03	1,923	21.6	10.4
Stormont	6	6	—	.61	1,994	26.4	10.7
Sudbury	19	19	—	1.93	1,819	25.8	12.7
Thunder Bay	22	22	—	2.23	1,725	24.7	10.5
Timiskaming	6	6	—	.61	1,853	20.7	10.6
Victoria	3	3	—	.30	2,518	12.1	5.6
Waterloo	40	40	—	4.05	1,785	24.2	11.9
Welland	24	24	—	2.43	1,949	21.5	10.8
Wellington	13	13	—	1.32	1,799	23.1	10.5
Wentworth	53	53	—	5.37	1,904	22.1	10.7
York	356	356	—	36.07	1,876	20.9	9.8
Military Bases	1	1	—	.10	2,115	8.9	3.9

TABLE A15 (Continued)
Hours Worked per Year, Gross Income per Chairside Hour, and Net Income per Hour Worked

(b) By Size of City

Size of city	No. of questionnaires returned	Number replied	No. not replied	Percentage of responding dentists	Hours worked per dentist	Gross income per chairside hour per dentist	Net income per chairside hour per dentist
Under– 1,000	5	5	—	.50	1,598	15.3	6.8
1,000 – 2,499	21	21	—	2.09	1,715	14.9	8.6
2,500 – 4,999	52	52	—	5.17	1,807	20.7	10.3
5,000 – 9,999	58	58	—	5.77	1,884	18.1	8.8
10,000 – 14,999	39	39	—	3.88	1,998	21.5	9.8
15,000 – 24,999	59	59	—	5.87	1,832	19.6	9.3
25,000 – 29,999	11	11	—	1.10	1,873	25.9	12.2
30,000 – 49,999	78	78	—	7.76	1,869	23.7	10.6
50,000 – 99,999	158	158	—	15.72	1,829	22.2	11.0
100,000 – 249,999	81	81	—	8.06	1,843	22.2	11.7
250,000 – 499,999	105	105	—	10.45	1,883	23.4	11.6
500,000 and over	338	338	—	33.63	1,867	21.2	10.0

(c) According to Age

Age	No. of questionnaires returned	Number replied	No. not replied	Percentage of responding dentists	Hours worked per dentist	Gross income per chairside hour per dentist	Net income per chairside hour per dentist
Under 25	21	17	4	1.71	2,979	11.00	6.81
25 – 29	160	137	23	13.74	9,105	18.94	8.22
30 – 34	182	166	16	16.65	9,507	19.05	10.29
35 – 39	157	152	5	15.25	9,746	21.24	11.69
40 – 44	173	161	12	16.15	9,558	22.19	12.13
45 – 49	128	123	5	12.34	9,524	19.84	10.74
50 – 54	64	62	2	6.22	8,724	21.15	11.65
55 – 59	49	44	5	4.41	9,570	18.28	9.68
60 – 64	52	42	10	4.21	8,492	16.36	9.63
65 – 69	64	58	6	5.82	8,597	14.30	8.03
70 – 74	32	29	3	2.91	7,072	14.43	7.79
75 and over	7	6	1	.61	4,965	11.33	4.51

TABLE A15 (Continued)

Hours Worked per Year, Gross Income per Chairside Hour, and Net Income per Hour Worked

(d) By Year of Graduation

Year of graduation	No. of questionnaires returned	Number replied	No. not replied	Percentage of responding dentists	Hours worked per dentist	Gross income per chairside hour per dentist	Net income per chairside hour per dentist
1967	2	2	—	.20	1,930	17.0	7.9
1966	28	28	—	2.84	1,292	15.7	7.1
1965	42	42	—	4.26	1,985	14.1	6.0
1964	38	38	—	3.86	1,900	20.1	8.4
1963	52	52	—	5.28	1,972	21.3	9.6
1962	30	30	—	3.05	1,917	21.5	10.0
1961	35	35	—	3.55	1,994	20.7	9.1
1960	39	39	—	3.96	1,930	22.7	10.3
1959	39	39	—	3.96	1,858	21.2	10.4
1954 – 1958	165	164	1	16.65	9,654	118.6	57.7
1949 – 1953	209	209	—	21.22	9,381	123.4	61.9
1944 – 1948	66	66	—	6.70	9,491	118.1	58.1
1939 – 1943	54	54	—	5.48	9,161	111.5	57.1
1934 – 1938	45	45	—	4.57	9,237	107.4	55.3
1929 – 1933	37	37	—	3.76	8,997	112.1	48.6
1924 – 1928	45	45	—	4.57	8,437	80.2	40.2
1919 – 1923	46	45	1	4.57	7,476	70.2	38.3
1914 – 1918	14	14	—	1.42	6,467	64.5	24.9
1913 and before	1	—	—	—	—	—	—

(e) According to Organization of Practice

Organization of practice	No. of questionnaires returned	Number replied	No. not replied	Percentage of responding dentists	Hours worked per dentist	Gross income per chairside hour per dentist	Net income per chairside hour per dentist
Solo practice	823	823	—	82.05	1,869	21.2	10.3
Sharing costs	139	139	—	13.86	1,817	22.0	10.5
Partnership	30	30	—	2.99	1,805	26.3	12.9
Not stated	11	11	—	1.10	1,761	24.3	10.5

TABLE A15 (Continued)

Hours Worked per Year, Gross Income per Chairside Hour, and Net Income per Hour Worked

(f) According to Type of Practice

Type of practice	No. of questionnaires returned	Number replied	No. not replied	Percentage of responding dentists	Hours worked per dentist	Gross income per chairside hour per dentist	Net income per chairside hour per dentist
General practitioner	927	927	—	85.28	1,874	20.7	10.0
Specialist	77	77	—	7.08	1,690	31.2	15.5
Oral surgeon	15	15	—	1.38	1,726	33.5	16.1
Orthodontist	31	31	—	2.85	1,759	30.7	15.5
Periodontist	11	11	—	1.01	1,389	27.8	16.1
Other	23	23	—	2.12	1,793	29.4	13.4
Not stated	3	3	—	.28	1,337	18.9	9.8

(g) By Extent of "Busyness"

Extent of busyness	No. of questionnaires returned	Number replied	No. not replied	Percentage of responding dentists	Hours worked per dentist	Gross income per chairside hour per dentist	Net income per chairside hour per dentist
Dentist too busy to treat all people requesting appointments	371	371	—	36.88	1,872	22.4	10.8
All people requesting appointments received them but dentist felt more rushed and/or worked more hours than liked	230	230	—	22.86	1,952	21.1	10.4
Dentists provided dental care for all who requested appointments, had enough but not too many patients	330	330	—	32.80	1,820	21.2	10.2
Dentist was not busy enough, would like to have had more patients	70	70	—	6.96	1,672	18.6	8.5
Not stated	5	5	—	.50	1,614	19.3	9.8

TABLE A16

Percentage Distribution of Dentists Absent from Practice by Amount of Time and Cause of Absence

(a) Weeks Spent on Vacation

Number of Weeks	Percentage of participating dentists	Cumulative percentage
0	3.4	3.4
1	3.7	7.1
2	19.1	26.2
3	24.4	50.6
4 – 5	31.2	81.8
6 – 7	10.4	92.2
8 – 9	3.6	95.8
10 – 13	2.9	98.7
14 – 19	.4	99.1
20 – 29	.2	99.3
30 – 49	—	—
50 or more	.1	99.4
Not stated	.6	100.0

(b) Days Absent from Work Because of Illness

Number of days	Percentage of participating dentists	Cumulative percentage
0	55.9	55.9
1	5.8	61.7
2	8.4	70.1
3	7.4	77.5
4 – 5	7.1	84.6
6 – 7	3.8	88.4
8 – 9	.8	89.2
10 – 13	2.9	92.1
14 – 19	2.4	94.5
20 – 29	1.6	96.1
30 – 49	1.5	97.6
50 or more	1.5	99.10
Not stated	1.0	100

TABLE A16 (Continued)
Percentage Distribution of Dentists Absent from Practice by Amount of Time and Cause of Absence

(c) Days Absent from Work Because of Dental Activities

Number of days	Percentage of participating dentists	Cumulative percentage
0	8.5	8.5
1	1.5	10.0
2	3.5	13.5
3	12.4	25.9
4 – 5	22.3	48.2
6 – 7	19.3	67.5
8 – 9	5.4	72.9
10 – 13	14.6	87.5
14 – 19	8.0	95.5
20 – 29	3.4	98.9
30 – 49	—	—
50 or more	.3	99.2
Not stated	1.0	100

TABLE A17

Amount of Time Absent from Practice by Cause of Absence

(a) According to County
(mean given)

County	Number of questionnaires returned	Weeks on vacation	Number replied	Number not replied	Percentage of responding dentists	Days absent due to illness	Number replied	Number not replied	Percentage of responding dentists	Days absent due to dental activities	Number replied	Number not replied	Percentage of responding dentists
Algoma	14	4.6	14	—	1.4	8.5	4	10	.9	8.5	11	3	1.1
Brant	7	6.0	7	—	.7	7.4	5	2	1.1	8.3	6	1	.6
Bruce	4	6.3	4	—	.4	10.0	1	3	.2	4.5	4	—	.4
Carleton	72	4.0	69	3	6.7	4.5	32	40	6.8	8.0	65	7	6.7
Cochrane	7	4.7	7	—	.7	20.3	3	4	.6	6.7	7	—	.7
Dufferin	3	5.7	3	—	.3	2.5	2	1	.4	5.3	3	—	.3
Dundas	1	8.0	1	—	—	—	—	—	—	—	—	—	—
Durham	4	2.8	4	—	.4	3.0	2	2	.4	6.5	4	—	.4
Elgin	14	4.3	5	9	.5	7.3	11	3	2.3	7.2	7	7	.7
Essex	29	4.4	28	1	2.7	5.7	9	20	1.9	7.1	22	7	2.3
Frontenac	16	3.7	15	1	1.5	12.2	6	10	1.3	7.7	9	7	.9
Glengarry	1	3.0	1	—	—	—	—	—	—	—	—	—	—
Grenville	1	6.0	1	—	.1	—	—	1	—	3.0	1	—	.1
Grey	7	3.8	6	1	.6	4.0	3	4	.6	4.6	7	—	.7
Haldimand	1	1.0	1	—	.1	3.0	1	—	.2	14.0	1	—	.1
Haliburton	—	—	—	—	—	—	—	—	—	—	—	—	—
Halton	32	3.7	31	1	3.0	11.1	15	17	3.2	7.2	29	3	3.0
Hastings	11	4.8	10	1	1.0	45.0	3	8	.6	9.1	10	1	1.0
Huron	4	2.7	3	1	.3	2.5	2	2	.4	4.0	3	1	.3
Kenora	3	4.0	2	1	.2	3.0	1	2	.2	1.3	3	—	.3
Kent	14	4.1	14	—	1.4	2.5	6	8	1.3	7.4	13	1	1.3
Lambton	11	3.6	11	—	1.1	21.0	5	6	1.1	6.5	10	1	1.0
Lanark	3	2.3	3	—	.3	—	—	3	—	5.0	2	1	.2
Leeds	3	3.3	3	—	.3	12.0	1	2	.2	4.5	2	1	.2
Lennox-Addington	1	2.0	1	—	—	—	—	—	—	—	—	—	—
Lincoln	24	7.3	23	1	2.2	4.3	12	12	2.6	9.3	21	3	2.2
Manitoulin	—	—	—	—	—	—	—	—	—	—	—	—	—
Middlesex	46	3.8	45	1	4.4	4.6	23	23	4.9	7.6	44	2	4.5
Muskoka	3	3.7	3	—	.3	—	—	3	—	10.5	2	1	.2

TABLE A17 (Continued)

Amount of Time Absent from Practice by Cause of Absence

(a) ACCORDING TO COUNTY *(continued)*
(mean given)

County	Number of question-naires returned	**Weeks on vaca-tion**	Number replied	Number not replied	Percentage of responding dentists	**Days absent due to illness**	Number replied	Number not replied	Percentage of responding dentists	**Days absent due to dental activities**	Number replied	Number not replied	Percentage of responding dentists
Nipissing	10	4.3	9	1	.9	15.3	6	4	1.3	5.3	10	—	1.0
Norfolk	8	5.6	7	1	.7	7.2	5	3	1.1	5.4	5	3	.5
Northumberland	5	4.4	5	—	.5	6.0	1	4	.2	7.8	5	—	.5
Ontario	23	4.6	22	1	2.1	7.3	4	19	.9	6.4	22	1	2.3
Oxford	13	3.6	12	1	1.2	5.9	7	6	1.5	6.1	11	2	1.1
Parry Sound	5	4.3	4	1	.4	2.7	3	2	.6	3.6	5	—	.5
Peel	22	3.1	21	1	2.0	4.9	8	14	1.7	5.2	20	2	2.1
Perth	6	3.5	6	—	.6	25.5	2	4	.4	5.6	5	1	.5
Peterborough	15	3.4	14	1	1.4	20.0	7	8	1.5	5.5	11	4	1.1
Prescott	2	6.0	2	—	.2	12.0	2	—	.4	5.0	2	—	.2
Prince Edward	1	2.0	1	—	—	—	—	—	—	—	—	—	—
Rainy River	1	10.0	1	—	—	—	—	—	—	—	—	—	—
Renfrew	13	4.3	13	—	1.3	15.1	8	5	1.7	8.8	13	—	1.3
Russell	1	—	—	1	—	—	—	1	—	2.0	1	—	.1
Simcoe	21	3.7	21	—	2.0	6.7	6	15	1.3	6.2	19	2	2.0
Stormont	6	3.2	5	1	.5	12.0	4	2	.9	8.0	5	1	.5
Sudbury	21	4.3	19	2	1.9	11.6	9	12	1.9	7.4	19	2	2.0
Thunder Bay	22	4.8	21	1	2.0	11.3	15	7	3.2	8.2	21	1	2.2
Timiskaming	6	3.5	6	—	.6	5.3	4	2	.9	7.0	6	—	.6
Victoria	3	2.7	3	—	.3	14.0	1	2	.2	4.3	3	—	.3
Waterloo	44	3.5	43	1	4.2	3.6	16	28	3.4	5.8	43	1	4.4
Welland	24	4.4	24	—	2.3	31.4	7	17	1.5	6.8	23	1	2.4
Wellington	13	4.2	13	—	1.3	3.8	5	8	1.1	4.6	12	1	1.2
Wentworth	60	4.5	58	2	5.6	9.8	23	37	4.9	7.5	53	7	5.5
York	395	3.8	382	13	37.1	10.3	173	222	36.8	8.4	366	29	37.6
Military Bases	2	5.5	2	—	.2	6.0	2	—	.4	15.5	2	—	.2

TABLE A17 (Continued)
Amount of Time Absent from Practice by Cause of Absence

(b) By City Size
(mean given)

City size	Number of question-naires returned	Weeks on vaca-tion	Number replied	Number not replied	Percentage of responding dentists	Days absent due to illness	Number replied	Number not replied	Percentage of responding dentists	Days absent due to dental activities	Number replied	Number not replied	Percentage of responding dentists
Under 1,000	5	8.0	5	—	.5	3.5	2	3	.4	2.7	3	2	.3
1,000 – 2,499	25	4.8	24	1	2.5	12.8	16	9	2.9	5.7	24	1	2.5
2,500 – 4,999	55	4.0	51	4	5.4	11.4	27	28	4.8	6.1	50	5	5.2
5,000 – 9,999	62	4.6	59	3	6.2	11.4	29	33	5.2	6.1	52	10	5.4
10,000 – 14,999	41	3.9	38	3	4.0	13.8	16	25	2.9	6.1	34	7	3.5
15,000 – 24,999	61	3.7	58	3	6.1	12.7	25	36	4.5	6.2	55	6	5.7
25,000 – 29,999	11	5.5	11	—	1.2	2.5	4	7	.7	6.4	10	1	1.1
30,000 – 49,999	80	4.0	76	4	8.0	11.1	38	42	6.8	7.1	75	5	7.8
50,000 – 99,999	175	12.1	69	106	7.2	7.4	156	19	27.8	6.7	127	48	13.2
100,000 – 249,999	90	3.7	88	2	9.2	5.2	38	52	6.8	7.4	80	10	8.3
150,000 – 499,999	116	4.0	111	5	11.6	7.1	48	68	8.5	7.5	103	13	10.7
500,000 and over	378	3.8	364	14	38.2	9.4	163	215	29.0	8.6	353	25	36.5

(c) According to Age
(mean given)

Age	Number of question-naires returned	Weeks on vaca-tion	Number replied	Number not replied	Percentage of responding dentists	Days absent due to illness	Number replied	Number not replied	Percentage of responding dentists	Days absent due to dental activities	Number replied	Number not replied	Percentage of responding dentists
Under 25	46	2.9	38	8	3.6	4.0	28	11	5.8	5.2	39	7	4.0
25 – 29	135	3.3	125	10	12.0	6.3	64	71	13.3	6.8	121	14	12.3
30 – 34	182	3.7	177	5	16.9	7.4	93	89	19.3	7.2	174	8	17.6
35 – 39	157	3.6	153	4	14.6	9.5	67	90	13.9	8.1	147	10	14.9
40 – 44	173	4.1	169	4	16.2	7.2	70	103	14.5	7.5	158	15	16.0
45 – 49	128	3.8	125	3	12.0	13.0	58	70	12.0	7.8	122	6	12.4
50 – 54	64	4.4	62	2	5.9	12.4	28	36	5.8	7.9	57	7	5.8
55 – 59	49	4.3	47	2	4.5	8.4	25	24	5.2	9.5	45	4	4.6

TABLE A17 (Continued)

Amount of Time Absent from Practice by Cause of Absence

(c) ACCORDING TO AGE *(continued)*
(mean given)

Age	Number of questionnaires returned	Weeks on vacation	Number replied	Number not replied	Percentage of responding dentists	Days absent due to illness	Number replied	Number not replied	Percentage of responding dentists	Days absent due to dental activities	Number replied	Number not replied	Percentage of responding dentists
60 – 64	52	5.4	49	3	4.7	9.5	15	37	3.1	7.0	47	5	4.8
65 – 69	64	5.8	62	2	5.9	23.7	17	47	3.5	7.8	49	15	5.0
70 – 74	32	6.5	32	—	3.1	12.5	14	18	2.9	6.5	25	7	2.5
75 and over	7	5.2	6	1	.6	71.0	3	4	.6	4.0	3	4	.3

(d) BY YEAR OF GRADUATION
(mean given)

Year of Graduation	Number of questionnaires returned	Weeks on vacation	Number replied	Number not replied	Percentage of responding dentists	Days absent due to illness	Number replied	Number not replied	Percentage of responding dentists	Days absent due to dental activities	Number replied	Number not replied	Percentage of responding dentists
1967	3	2.0	2	1	.2	—	—	3	—	7.5	2	1	.2
1966	37	2.6	25	12	2.4	10.4	9	28	1.9	4.0	28	9	2.9
1965	50	3.1	46	4	4.5	7.7	24	26	5.2	5.6	44	6	4.5
1964	42	3.6	39	3	3.8	6.9	20	22	4.3	6.6	32	10	3.3
1963	57	4.1	55	2	5.3	6.0	27	30	5.8	7.8	57	—	5.9
1962	35	3.7	34	1	3.3	13.1	20	15	4.3	7.6	33	2	3.4
1961	37	3.3	37	—	3.6	16.8	24	13	5.2	7.2	37	—	3.8
1960	40	3.5	37	3	3.6	6.9	20	20	4.3	6.5	37	3	3.8
1959	42	3.6	42	—	4.1	3.3	18	24	3.9	7.1	42	—	4.3
1954 – 1958	176	3.8	174	2	16.9	5.9	75	101	16.2	7.5	171	5	17.6
1949 – 1953	217	4.0	216	1	20.9	8.3	99	118	21.4	7.8	198	19	20.4
1944 – 1948	69	4.0	68	1	6.6	12.0	28	41	6.1	7.7	63	6	6.5
1939 – 1943	58	3.7	55	3	5.3	11.0	21	37	4.5	10.6	53	5	5.5
1934 – 1938	48	4.7	47	1	4.6	8.5	21	27	4.5	8.9	46	2	4.7
1929 – 1933	42	5.4	38	4	3.7	10.6	18	24	3.9	8.4	37	5	3.8
1924 – 1928	55	5.5	53	2	5.1	12.6	16	39	3.5	7.9	46	9	4.7
1919 – 1923	52	6.2	51	1	4.9	22.3	16	36	3.5	7.3	38	14	3.9
1914 – 1918	14	5.9	12	2	1.2	27.6	7	7	1.5	6.9	8	6	.8
1913 and before	1	—	—	—	—	—	—	—	—	—	—	—	—

TABLE A17 (Continued)

Amount of Time Absent from Practice by Cause of Absence

(e) According to Organization of Practice (mean given)

Organization of practice	Number of question-naires returned	Weeks on vaca-tion	Number replied	Number not replied	Percentage of responding dentists	Days absent due to illness	Number replied	Number not replied	Percentage of responding dentists	Days absent due to dental activities	Number replied	Number not replied	Percentage of responding dentists
Solo Practice	898	4.1	865	33	83.2	10.7	397	501	85.0	7.5	813	85	83.1
Sharing costs	151	4.0	146	5	14.0	6.2	58	93	12.4	7.4	134	17	13.7
Partnership	32	3.4	29	3	2.8	5.8	12	20	2.6	9.4	31	1	3.2

(f) According to Type of Practice

Type of Practice	Number of question-naires returned	Weeks on vaca-tion	Number replied	Number not replied	Percentage of responding dentists	Days absent due to illness	Number replied	Number not replied	Percentage of responding dentists	Days absent due to dental activities	Number replied	Number not replied	Percentage of responding dentists
General Practitioner	1,010	4.1	972	38	92.0	10.0	449	561	94.0	7.2	908	102	91.0
Specialist	88	3.8	84	4	8.0	8.6	28	60	6.0	11.1	87	1	9.0
Oral surgeon	16	3.8	14	2	1.3	6.8	5	11	1.0	12.0	15	1	1.5
Orthodontist	35	3.7	35	—	3.3	3.7	9	26	1.9	11.5	35	—	3.5
Periodontist	12	3.8	11	1	1.0	7.5	4	8	1.0	10.5	12	—	1.2
Other	25	4.0	24	1	2.3	13.8	10	15	2.1	10.1	22	—	2.5

TABLE A18

Number of Patients and Patient Visits

(a) By County

County	Number of patients per dentist	No. of question-aires returned	Number replied	No. not replied	Percentage of responding dentists	Number of visits per dentist	Number replied	No. not replied	Percentage of responding dentists
Algoma	1,182.9	14	12	2	1.7	3,368.1	11	3	1.3
Brant	1,272.5	7	4	3	.6	2,135.0	6	1	.7
Bruce	1,550.0	4	2	2	.3	3,240.0	3	1	.4
Carleton	1,473.3	72	52	20	7.3	3,841.3	62	10	7.2
Cochrane	1,253.3	7	6	1	.8	3,209.8	6	1	.7
Dufferin	1,150.0	3	2	1	.3	3,250.0	2	1	.2
Dundas	—	1	—	—	—	—	—	—	—
Durham	1,500.0	4	2	2	.3	2,387.5	4	—	.5
Elgin	1,674.0	14	9	5	1.3	3,601.0	11	3	1.3
Essex	1,650.5	29	15	14	2.1	4,012.9	19	10	2.2
Frontenac	1,380.5	16	10	6	1.4	3,493.2	13	3	1.5
Glengarry	3,000.0	1	—	—	—	—	—	—	—
Grenville	1,800.0	1	—	—	—	—	—	—	—
Grey	1,241.7	7	6	1	.8	3,022.1	7	—	.8
Haldimand	—	1	—	—	—	—	—	—	—
Haliburton	—	—	—	—	—	—	—	—	—
Halton	1,198.7	32	24	8	3.4	3,808.6	27	5	3.1
Hastings	1,404.1	11	6	5	.8	3,038.3	10	1	1.2
Huron	2,000.0	4	2	2	.3	5,000.0	3	1	.4
Kenora	2,000.0	3	1	2	.1	2,833.3	3	—	.4
Kent	1,438.4	14	11	3	1.5	2,769.7	11	3	1.3
Lambton	1,600.0	11	4	7	.6	4,116.4	9	2	1.1
Lanark	1,026.7	3	3	—	.4	3,553.3	3	—	.4
Leeds	1,750.0	3	2	1	.3	3,331.7	3	—	.4
Lennox-Addington	2,000.0	1	—	—	—	—	—	—	—
Lincoln	1,427.1	24	22	2	3.1	3,560.0	22	2	2.5
Manitoulin	—	—	—	—	—	—	—	—	—
Middlesex	1,308.1	46	29	17	4.1	3,486.4	39	7	4.5

TABLE A18 (Continued)
Number of Patients and Patient Visits

(a) By County *(continued)*

County	Number of patients per dentist	No. of question-naires returned	Number replied	No. not replied	Percentage of responding dentists	Number of visits per dentist	Number replied	No. not replied	Percentage of responding dentists
Muskoka	850.0	3	1	2	.1	3,399.0	2	1	.2
Nipissing	1,885.1	10	7	3	1.0	3,650.0	9	1	1.1
Norfolk	910.0	8	5	3	.7	2,692.0	8	—	.9
Northumberland	1,675.0	5	4	1	.6	5,050.0	4	1	.5
Ontario	1,927.5	23	17	6	2.4	3,520.0	18	5	2.1
Oxford	1,602.0	13	10	3	1.4	3,979.5	11	2	1.3
Parry Sound	937.5	5	2	3	.3	2,530.0	5	—	.6
Peel	1,426.5	22	15	7	2.1	3,785.9	19	3	2.2
Perth	1,483.3	6	3	3	.4	3,182.0	5	1	.6
Peterborough	1,596.2	15	11	4	1.5	3,342.8	14	1	1.6
Prescott	1,500.0	2	—	—	—	—	—	—	—
Prince Edward	2,500.0	1	—	—	—	—	—	—	—
Rainy River	550.0	1	—	—	—	—	—	—	—
Renfrew	1,325.0	13	9	4	1.3	3,349.5	11	2	1.3
Russell	200.0	1	—	—	—	—	—	—	—
Simcoe	1,757.4	21	16	5	2.2	4,003.4	21	—	2.4
Stormont	2,125.0	6	4	2	.6	4,880.0	5	1	.6
Sudbury	1,655.8	21	18	3	2.5	3,734.3	20	1	2.3
Thunder Bay	1,695.5	22	13	9	1.8	3,188.7	15	7	1.7
Timiskaming	1,595.0	6	4	2	.6	4,320.0	5	1	.6
Victoria	2,033.3	3	3	—	.4	3,433.3	3	—	.4
Waterloo	1,432.5	44	33	11	4.6	3,800.5	40	4	4.6
Welland	1,444.6	24	13	11	1.8	3,883.2	19	5	2.2
Wellington	1,555.5	13	9	4	1.3	3,495.5	11	2	1.3
Wentworth	997.8	60	42	18	5.9	3,496.4	48	12	5.5
York	1,529.7	395	241	154	33.8	3,324.6	291	104	33.6
Military bases	777.0	2	2	—	.3	5,160.0	2	—	.2

TABLE A18 (Continued)
Number of Patients and Patient Visits

(b) By City Size

City size	Number of patients per dentist	No. of question-naires returned	Number replied	No. not replied	Percentage of responding dentists	Number of visits per dentist	Number replied	No. not replied	Percentage of responding dentists
Under 1,000	1,550.0	5	4	1	.5	2,443.0	5	—	.6
1,000 – 2,499	1,226.4	25	14	11	1.9	3,135.5	19	6	2.1
2,500 – 4,999	1,402.2	55	36	19	4.8	3,399.1	43	12	4.8
5,000 – 9,999	1,700.9	62	43	19	5.8	3,574.9	53	9	5.9
10,000 – 14,999	1,877.5	41	30	11	4.0	4,891.4	36	5	4.0
15,000 – 24,999	1,212.8	61	40	21	5.4	3,501.6	53	8	5.9
25,000 – 29,999	2,506.7	11	7	4	.9	6,337.7	10	1	1.1
30,000 – 49,999	1,701.8	80	51	29	6.8	3,700.9	59	21	6.6
50,000 – 99,999	1,367.6	175	152	23	20.3	3,444.4	170	5	19.0
100,000 – 249,999	1,357.4	90	55	35	7.4	3,713.3	73	17	8.1
250,000 – 499,999	1,274.6	116	82	34	11.0	3,719.5	95	21	10.6
500,000 and over	1,100.9	378	234	144	3.13	3,195.7	281	97	31.3

(c) By Age

Under 25	851.4	46	25	21	3.5	2,815.3	31	15	3.6
25 – 29	2,092.8	135	100	35	13.8	3,647.4	115	20	13.2
30 – 34	1,582.5	182	121	61	16.7	4,031.3	147	35	16.9
35 – 39	1,308.5	157	103	54	14.3	3,778.8	129	28	14.8
40 – 44	1,484.5	173	129	44	17.8	3,857.8	147	26	16.9
45 – 49	1,653.5	128	86	42	11.9	3,859.6	105	23	12.1
50 – 54	1,361.3	64	40	24	5.5	3,461.0	52	12	6.0
55 – 59	1,321.7	49	33	16	4.6	3,569.4	39	10	4.5
60 – 64	917.0	52	27	25	3.7	2,349.3	37	15	4.3
65 – 69	933.0	64	35	29	4.8	2,216.4	44	20	5.1
70 – 74	507.8	32	21	11	2.9	2,090.9	21	11	2.4
75 and over	533.3	7	3	4	.4	1,425.0	4	3	.5

TABLE A18 (Continued)
Number of Patients and Patient Visits

(d) By Year of Graduation

Year of graduation	Number of patients per dentist	No. of question-naires returned	Number replied	No. not replied	Percentage of responding dentists	Number of visits per dentist	Number replied	No. not replied	Percentage of responding dentists
1966	954.5	37	20	17	2.8	2,805.4	23	14	2.7
1965	1,385.0	50	35	15	4.9	4,025.9	41	9	4.8
1964	1,067.1	42	30	12	4.2	3,850.1	35	7	4.1
1963	1,258.1	57	40	17	5.6	3,786.1	45	12	5.2
1962	1,220.7	35	24	11	3.3	3,426.9	29	6	3.4
1961	1,370.8	37	27	10	3.8	3,477.3	34	3	3.9
1960	1,194.0	40	37	3	5.1	3,832.2	37	3	4.3
1959	1,850.8	42	30	12	4.2	4,353.7	34	8	3.9
1954 – 1958	1,404.2	176	109	67	15.1	3,816.3	143	33	16.6
1949 – 1953	1,544.2	217	164	53	22.8	3,959.3	190	27	22.0
1944 – 1948	1,424.7	69	47	22	6.5	3,903.8	54	15	6.3
1939 – 1943	1,593.1	58	37	21	5.1	3,536.9	45	13	5.2
1934 – 1938	1,458.3	48	32	16	4.4	3,368.7	38	10	4.4
1929 – 1933	1,203.3	42	23	19	3.2	2,918.0	32	10	3.7
1924 – 1928	836.9	55	29	26	4.0	2,084.8	37	18	4.3
1919 – 1923	797.3	52	28	24	3.9	1,862.1	34	18	3.9
1914 – 1918	780.8	14	6	8	.8	1,988.9	9	5	1.0
1913 and before	—	1	—	—	—	—	—	—	—

(e) According to Organization of Practice

Organization of practice	Number of patients per dentist	No. of question-naires returned	Number replied	No. not replied	Percentage of responding dentists	Number of visits per dentist	Number replied	No. not replied	Percentage of responding dentists
Solo practice	1,502	898	586	312	82.8	4,335	715	183	82.9
Sharing costs	1,268	151	100	51	14.1	4,340	122	29	14.1
Partnership	1,282	32	22	10	3.1	4,456	26	6	3.0

TABLE A18 (Continued)
Number of Patients and Patient Visits

(f) ACCORDING TO TYPE OF PRACTICE

Type of practice	Number of patients per dentist	No. of question-naires returned	Number replied	No. not replied	Percentage of responding dentists	Number of visits per dentist	Number replied	No. not replied	Percentage of responding dentists
General practitioner	1,512.7	1,010	663	347	—	3,552.8	815	195	—
Specialist	1,106.6	85	59	26	—	3,417.9	63	23	—
Oral surgeon	3,006.3	16	12	4	—	5,115.4	13	3	—
Orthodontist	264.3	35	23	12	—	3,544.4	21	14	—
Periodontist	943.5	12	10	2	—	3,175.2	10	2	—
Other	1,231.1	25	17	8	—	3,357.6	21	4	—

TABLE A19

Percentage Distribution of Dentists by Average Length of Appointments

(a) By County

County	Average length of appointments					
	Less than 30 min.	30 min.	45 min.	1 hour	Longer than 1 hour	Not stated
Algoma	14.3	71.4	14.3	—	—	—
Brant	14.3	57.1	28.6	—	—	—
Bruce	25.0	25.0	50.0	—	—	—
Carleton	11.1	61.1	22.2	2.7	2.7	—
Cochrane	—	42.9	57.1	—	—	—
Dufferin	—	66.7	33.3	—	—	—
Dundas	—	100.0	—	—	—	—
Durham	—	75.0	25.0	—	—	—
Elgin	7.1	50.0	35.7	7.1	—	—
Essex	14.3	71.4	10.7	3.6	—	—
Frontenac	18.8	62.5	18.8	—	—	—
Glengarry	100.0	—	—	—	—	—
Grenville	—	100.0	—	—	—	—
Grey	—	71.4	28.6	—	—	—
Haldimand	—	100.0	—	—	—	—
Haliburton	—	—	—	—	—	—
Halton	9.4	59.4	25.0	6.3	—	—
Hastings	—	63.6	18.2	18.2	—	—
Huron	—	50.0	50.0	—	—	—
Kenora	—	66.7	33.3	—	—	—
Kent	—	64.3	21.4	14.3	—	—
Lambton	—	72.7	27.3	—	—	—
Lanark	—	33.3	33.3	33.3	—	—
Leeds	—	33.3	66.7	—	—	—
Lennox-Addington	100.0	—	—	—	—	—
Lincoln	8.3	50.0	33.3	8.3	—	—
Manitoulin	—	—	—	—	—	—
Middlesex	4.4	41.3	37.0	15.2	2.2	—
Muskoka	—	33.3	66.7	—	—	—
Nipissing	20.0	60.0	20.0	—	—	—
Norfolk	—	75.0	12.5	12.5	—	—
Northumberland	—	60.0	40.0	—	—	—
Ontario	4.4	78.9	17.4	4.4	—	—
Oxford	7.7	46.2	38.5	7.7	—	—
Parry Sound	—	40.0	40.0	20.0	—	—
Peel	4.6	72.7	18.2	—	4.6	—

TABLE A19 (Continued)
Percentage Distribution of Dentists by Average Length of Appointments

(a) By County *(continued)*

County	Average length of appointments					
	Less than 30 min.	30 min.	45 min.	1 hour	Longer than 1 hour	Not stated
Perth	16.7	50.0	33.3	—	—	—
Peterborough	—	60.0	26.7	13.3	—	—
Prescott	—	50.0	50.0	—	—	—
Prince Edward	—	100.0	—	—	—	—
Rainy River	—	100.0	—	—	—	—
Renfrew	23.1	61.5	7.7	7.7	—	—
Russell	—	—	100.0	—	—	—
Simcoe	19.1	57.1	19.1	—	4.8	—
Stormont	50.0	33.3	16.7	—	—	—
Sudbury	14.3	76.2	9.5	—	—	—
Thunder Bay	—	59.1	27.3	13.6	—	—
Timiskaming	—	83.3	16.7	—	—	—
Victoria	—	66.7	33.3	—	—	—
Waterloo	6.8	72.7	15.9	4.6	—	—
Welland	16.7	66.7	8.3	8.3	—	—
Wellington	—	46.2	53.9	—	—	—
Wentworth	1.7	75.0	16.7	5.0	1.7	—
York	5.4	61.7	24.7	6.9	1.3	—
Military bases	50.0	50.0	—	—	—	—
Not stated	4.4	69.6	21.7	4.4	—	—
Total	7.2	62.0	23.9	5.9	1.0	—

(b) According to City Size

Under 1,000	37.5	37.5	25.0	—	—	—
1,000 – 2,499	15.4	57.7	26.9	—	—	—
2,500 – 4,999	10.5	59.6	22.8	7.0	—	—
5,000 – 9,999	8.2	63.9	23.0	3.3	1.6	—
10,000 – 14,999	12.2	58.5	26.8	—	2.4	—
15,000 – 24,999	1.8	63.2	29.8	5.3	—	—
25,000 – 29,999	47.4	36.8	10.5	5.3	—	—
30,000 – 49,999	17.4	54.7	20.9	7.0	—	—
50,000 – 99,999	2.4	71.3	20.1	6.1	—	—
100,000 – 249,999	9.6	54.3	26.6	8.5	1.1	—
250,000 – 499,999	14.4	59.2	20.8	3.2	2.4	—
500,000 and over	—	64.7	26.3	7.6	1.4	—
Not stated	—	100.0	—	—	—	—
Total	7.2	62.0	23.9	5.9	1.0	—

TABLE A19 (Continued)

Percentage Distribution of Dentists by Average Length of Appointments

(c) According to Age

	Average length of appointments					
	Less than 30 min.	30 min.	45 min.	1 hour	Longer than 1 hour	Not stated
Under 25	—	42.9	57.1	—	—	—
25 – 29	1.9	58.8	30.6	6.8	1.9	—
30 – 34	12.1	63.7	19.8	3.9	.6	—
35 – 39	7.7	67.7	20.0	4.5	—	—
40 – 44	12.2	56.4	25.6	4.7	1.2	—
45 – 49	7.8	70.3	17.2	3.1	1.6	—
50 – 54	6.3	73.4	15.6	4.7	—	—
55 – 59	8.2	55.1	26.5	10.2	—	—
60 – 64	2.0	54.9	31.4	9.8	2.0	—
65 – 69	3.1	60.9	23.4	9.4	3.1	—
70 – 74	—	46.9	31.3	21.9	—	—
75 and over	—	42.9	42.9	14.3	—	—
Not stated	—	83.3	8.3	8.3	—	—
Total	7.2	62.0	23.9	5.9	1.0	—

(d) By Year of Graduation

	Average length of appointments					
Year of graduation	Less than 30 min.	30 min.	45 min.	1 hour	Longer than 1 hour	Not stated
1960 to present	4.7	58.1	28.9	7.0	1.3	—
1950 – 1959	11.5	64.6	20.5	3.4	—	—
1940 – 1949	7.1	69.0	18.3	3.5	2.1	—
1930 – 1939	5.6	58.4	25.8	10.1	—	—
1920 – 1929	1.8	58.9	27.7	8.9	2.7	—
1910 – 1919	—	44.4	33.3	22.2	—	—
1900 – 1909	—	—	100.0	—	—	—
Before 1900	—	—	—	—	—	—
Not stated	4.2	66.7	16.7	8.3	4.2	—
Total	7.2	62.0	23.9	5.9	1.0	—

TABLE A19 (Continued)

Percentage Distribution of Dentists by Average Length of Appointments

(e) According to Organization of Practice

Organization of practice	Average length of appointments					
	Less than 30 min.	30 min.	45 min.	1 hour	Longer than 1 hour	Not stated
Not in private practice	—	83.3	16.7	—	—	—
Solo practice	7.5	63.0	22.5	5.9	0.8	0.3
Sharing costs	5.3	53.6	30.5	7.3	2.6	0.7
Partnership	12.5	56.3	28.1	3.1	—	—
Other	—	—	—	—	—	—
Not stated	—	71.4	28.6	—	—	—
Total	7.2	61.8	23.8	5.9	1.0	0.4

(f) According to Type of Practice

Type of practice	Average length of appointments					
	Less than 30 min.	30 min.	45 min.	1 hour	Longer than 1 hour	Not stated
General practitioner	6.7	62.6	24.2	5.9	.6	.1
Specialist	13.6	50.0	20.5	6.8	5.7	—
Oral surgeon	37.5	43.8	12.5	—	—	6.3
Orthodontist	14.3	57.1	14.3	5.7	2.9	5.7
Periodontist	—	33.3	58.3	—	8.3	—
Other	4.0	52.0	16.0	16.0	12.0	—
Not stated	—	100.0	—	—	—	100.0
Total	7.2	61.8	23.8	5.9	1.0	0.4

TABLE A20

Fees Charged for Specified Services

(a) By County

Net income from practice		Algoma	Brant	Bruce	Carleton	Cochran
	No. of quest. returned	14	7	4	72	7
	No. replied	13	6	4	66	7
Prophylaxis	No. not replied	1	1	—	6	—
	% replied	1.3	.6	.4	6.7	.7
	Fees per dentist	6.7	5.7	5.3	7.4	6.6
	No. of quest. returned	14	7	4	72	7
	No. replied	14	7	4	65	7
Filling (amalgam)	No. not replied	—	—	—	7	—
	% replied	1.4	.7	.4	6.6	.7
	Fees per dentist	7.7	7.3	5.3	8.4	6.6
	No. of quest. returned	14	7	4	72	7
	No. replied	14	7	4	65	7
(silicate)	No. not replied	—	—	—	7	—
	% replied	1.4	.7	.4	6.6	.7
	Fees per dentist	7.3	6.6	5.8	7.5	6.0
	No. of quest. returned	14	7	4	72	7
	No. replied	14	7	4	66	7
Extraction	No. not replied	—	—	—	6	—
	% replied	1.4	.7	.4	6.7	.7
	Fees per dentist	6.6	6.0	5.5	7.1	5.6
	No. of quest. returned	14	7	4	72	7
	No. replied	11	6	3	41	6
Gold inlay	No. not replied	3	1	1	31	1
	% replied	1.4	.8	.4	5.3	.8
	Fees per dentist	31.9	30.8	25.0	41.0	32.5
	No. of quest. returned	14	7	4	72	7
	No. replied	14	6	4	61	7
Upper denture	No. not replied	—	1	—	11	—
	% replied	1.4	.6	.4	6.2	.7
	Fees per dentist	101.4	94.2	88.8	113.2	84.3

Dufferin	Durham	Elgin	Essex	Frontenac	Grey	Halton	Hastings	Huron	Kenora
3	4	14	29	16	7	32	11	4	3
3	4	12	28	15	7	28	11	3	3
—	—	2	1	1	—	4	—	1	—
.3	.4	1.2	2.8	1.5	.7	2.8	1.1	.3	.3
7.0	6.8	5.9	6.3	5.7	5.6	7.4	6.5	6.7	5.0
3	4	14	29	16	7	32	11	4	3
3	4	12	27	15	7	28	11	4	3
—	—	2	2	1	—	4	—	—	—
.3	.4	1.2	2.7	1.5	.7	2.8	1.1	.4	.3
8.0	7.3	7.3	6.9	7.3	6.4	7.1	7.1	5.8	8.7
3	4	14	29	16	7	32	11	4	3
3	4	12	28	15	7	28	11	4	3
—	—	2	1	1	—	4	—	—	—
.3	.4	1.2	2.8	1.5	.7	2.8	1.1	.4	.3
6.7	6.3	6.8	6.5	6.9	5.9	6.8	6.9	5.8	7.7
3	4	14	29	16	7	32	11	4	3
3	4	12	28	15	7	28	11	4	3
—	—	2	1	1	—	4	—	—	—
.3	.4	1.2	2.9	1.5	.7	2.9	1.1	.4	.3
5.0	6.3	6.0	5.9	6.1	4.9	6.8	6.3	5.5	6.7
3	4	14	29	16	7	32	11	4	3
3	3	9	21	11	6	23	10	3	1
—	1	5	8	5	1	9	1	1	2
.4	.4	1.2	2.7	1.4	.8	3.0	1.3	.4	.1
31.0	41.7	37.2	34.4	31.5	21.7	40.0	40.0	28.3	30.0
3	4	14	29	16	7	32	11	4	3
3	4	13	28	15	7	28	11	4	3
—	—	1	1	1	—	4	—	—	—
.3	.4	1.3	2.9	1.5	.7	2.9	1.1	.4	.3
98.3	92.5	106.2	103.5	99.5	83.1	106.4	106.7	87.5	96.7

TABLE A20 (Continued)

Fees Charged for Specified Services

(a) By County *(continued)*

Net income from practice		Kent	Lambton	Lanark	Leeds	Lincoln
	No. of quest. returned	14	11	3	3	24
	No. replied	13	11	3	3	22
Prophylaxis	No. not replied	1	—	—	—	2
	% replied	1.3	1.1	.3	.3	2.2
	Fees per dentist	5.9	6.6	5.0	6.3	6.8
	No. of quest. returned	14	11	3	3	24
	No. replied	13	11	3	3	22
Filling (amalgam)	No. not replied	1	—	—	—	2
	% replied	1.3	1.1	.3	.3	2.2
	Fees per dentist	7.4	8.0	6.7	7.0	7.7
	No. of quest. returned	14	11	3	3	24
	No. replied	13	11	3	3	22
(silicate)	No. not replied	1	—	—	—	2
	% replied	1.3	1.1	.3	.3	2.2
	Fees per dentist	6.9	7.2	6.7	6.3	7.4
	No. of quest. returned	14	11	3	3	24
	No. replied	13	11	3	3	23
Extraction	No. not replied	1	—	—	—	1
	% replied	1.3	1.1	.3	.3	2.3
	Fees per dentist	6.2	6.7	5.3	6.0	6.7
	No. of quest. returned	14	11	3	3	24
	No. replied	10	10	1	3	19
Gold inlay	No. not replied	4	1	2	—	5
	% replied	1.3	1.3	.1	.4	2.5
	Fees per dentist	38.5	40.7	35.0	38.3	40.9
	No. of quest. returned	14	11	3	3	24
	No. replied	13	11	3	3	22
Upper denture	No. not replied	1	—	—	—	2
	% replied	1.3	1.1	.3	.3	2.2
	Fees per dentist	95.8	114.4	85.0	88.3	15.6

Middlesex	Muskoka	Nipissing	Norfolk	North-umber-land	Ontario	Oxford	Parry Sound	Peel	Perth
46	3	10	8	5	23	23	5	22	6
43	3	10	8	5	22	22	5	21	6
3	—	—	—	—	1	1	—	1	—
4.4	.3	1.0	.8	.5	2.2	1.2	.5	2.1	.6
6.4	6.7	7.2	6.0	5.6	5.9	6.7	5.6	7.0	5.3
46	3	10	8	5	23	13	5	22	6
43	3	10	8	5	22	12	5	21	6
3	—	—	—	—	1	1	—	1	—
4.4	.3	1.0	.8	.5	2.2	1.2	.5	2.1	.6
7.8	6.0	7.6	7.4	6.8	7.1	8.3	7.8	7.0	6.7
46	3	10	8	5	23	13	5	22	6
43	3	10	8	5	22	12	5	21	6
3	—	—	—	—	1	1	—	1	—
4.4	.3	1.0	.8	.5	2.2	1.2	.5	2.1	.6
6.9	5.3	7.1	6.5	6.4	6.8	7.0	7.0	6.8	6.2
46	3	10	8	5	23	13	5	22	6
42	3	10	8	5	22	12	5	20	5
4	—	—	—	—	1	1	—	2	1
4.3	.3	1.0	.8	.5	2.2	1.2	.5	2.0	.5
6.4	4.7	6.6	6.5	5.2	6.2	6.2	5.4	6.5	6.6
46	3	10	8	5	23	13	5	22	6
34	2	7	6	5	18	10	2	14	4
12	1	3	2	—	5	3	3	8	2
4.4	.3	.9	.8	.7	2.3	1.3	.3	1.8	.5
38.6	25.0	39.3	35.0	37.0	37.1	41.6	37.5	42.6	35.0
46	3	10	8	5	23	13	5	22	6
43	3	10	8	5	22	12	5	20	6
3	—	—	—	—	1	1	—	2	—
4.4	.3	1.0	.8	.5	2.2	1.2	.5	2.0	.6
102.7	86.7	99.0	95.0	89.0	91.7	90.0	101.0	105.3	92.5

TABLE A20 (Continued)

Fees Charged for Specified Services

(a) By County *(continued)*

Net income from practice		Peter-borough	Prescott	Renfrew	Simcoe	Stormont
	No. of quest. returned	15	2	13	21	6
	No. replied	15	2	13	21	6
Prophylaxis	No. not replied	—	—	—	—	—
	% replied	1.5	.2	1.3	2.1	.6
	Fees per dentist	5.5	5.0	6.2	6.6	5.5
	No. of quest. returned	15	2	13	21	6
	No. replied	15	2	13	21	6
Filling (amalgam)	No. not replied	—	—	—	—	—
	% replied	1.5	.2	1.3	2.1	.6
	Fees per dentist	7.0	5.0	6.9	7.1	7.8
	No. of quest. returned	15	2	13	21	6
	No. replied	15	2	13	21	6
(silicate)	No. not replied	—	—	—	—	—
	% replied	1.5	.2	1.3	2.1	.6
	Fees per dentist	6.4	5.0	6.7	6.4	7.0
	No. of quest. returned	15	2	13	21	6
	No. replied	15	2	13	21	6
Extraction	No. not replied	—	—	—	—	—
	% replied	1.5	.2	1.3	2.1	.6
	Fees per dentist	6.4	5.0	6.0	6.1	6.0
	No. of quest. returned	15	2	13	21	6
	No. replied	12	—	11	15	5
Gold inlay	No. not replied	3	2	2	6	1
	% replied	1.6	—	1.4	1.9	.7
	Fees per dentist	34.2	—	29.3	31.4	36.0
	No. of quest. returned	15	2	13	21	6
	No. replied	15	2	13	21	6
Upper denture	No. not replied	—	—	—	—	—
	% replied	.5	.2	1.3	2.1	.6
	Fees per dentist	106.0	65.0	95.0	93.8	100.0

Sudbury	Thunder Bay	Timis-kaming	Victoria	Waterloo	Welland	Welling-ton	Went-worth	York	Military Bases
21	22	6	3	44	24	13	60	395	2
19	20	6	3	42	23	13	50	348	1
2	2	—	—	2	1	—	10	47	1
1.9	2.0	.6	.3	4.3	2.3	1.3	5.1	35.3	.1
6.6	8.1	5.5	4.7	6.1	6.0	7.2	7.0	7.2	6.0
21	22	6	3	44	24	13	60	395	2
19	21	6	3	42	23	13	51	343	1
2	1	—	—	2	1	—	9	52	1
1.9	2.1	.6	.3	4.3	2.3	1.3	5.2	34.8	.1
7.2	8.2	8.0	5.7	7.2	7.0	7.9	7.7	7.7	8.0
21	22	6	3	44	24	13	60	395	2
19	21	6	3	42	23	13	51	343	1
2	1	—	—	2	1	—	9	52	1
1.9	2.1	.6	.3	4.3	2.3	1.3	5.2	34.8	.1
6.4	7.4	7.3	4.7	6.6	6.6	7.1	7.0	7.1	6.0
21	22	6	3	44	24	13	60	395	2
19	21	6	3	42	23	13	51	342	1
2	1	—	—	2	1	—	9	53	1
1.9	2.1	.6	.3	4.3	2.3	1.3	5.2	34.8	.1
6.2	6.8	6.0	5.0	6.2	6.4	6.6	6.5	6.8	6.0
21	22	6	3	44	24	13	60	395	2
16	17	5	3	34	21	10	37	280	—
5	5	1	—	10	3	3	23	115	2
2.1	2.2	.7	.4	4.4	2.7	1.3	4.8	36.1	—
42.2	38.4	39.0	30.0	49.7	38.0	39.5	38.4	40.3	—
21	22	6	3	44	24	13	60	395	2
19	21	6	3	42	23	13	52	343	1
2	1	—	—	2	1	—	8	52	1
1.9	2.1	.6	.3	4.3	2.3	1.3	5.3	34.9	.1
96.6	102.4	94.7	78.3	107.7	101.1	109.6	120.7	114.1	95.0

TABLE A20 (Continued)
Fees Charged for Specified Services

(b) By City Size

City size		Under 1,000	1,000-2,499	2,500-4,999	5,000-9,999	10,000-14,999	15,000-24,999	25,000-29,999	30,000-49,999	50,000-99,999	100,000-249,999	250,000-499,999	500,000 + over
	No. of quest. returned	5	25	55	62	41	61	11	80	175	90	116	378
	No. replied	5	25	55	58	40	59	11	76	162	81	104	331
Prophylaxis	No. not replied	—	—	—	4	1	2	—	4	13	9	12	47
	% replied	.5	2.5	5.5	5.8	4.0	5.9	1.1	7.6	16.1	8.0	10.3	32.9
	Fees per dentist	4.0	6.0	6.0	6.0	6.0	6.4	6.3	6.5	6.7	6.5	7.4	7.3
	No. of quest. returned	5	25	55	62	41	61	11	80	175	90	116	378
Filling	No. replied	5	25	55	59	40	59	11	76	165	82	103	325
(amalgam)	No. not replied	—	—	—	3	1	2	—	4	10	8	13	53
	% replied	.5	2.5	5.5	5.9	4.0	5.9	1.1	7.6	16.4	8.2	10.3	32.3
	Fees per dentist	5.4	6.7	6.7	7.0	6.7	7.7	7.3	7.4	7.5	7.5	8.2	7.8
	No. of quest. returned	5	25	55	62	41	61	11	80	175	90	116	378
	No. replied	5	25	55	59	40	59	11	76	165	83	103	325
(silicate)	No. not replied	—	—	—	3	1	2	—	4	10	7	13	53
	% replied	.5	2.5	5.5	5.9	4.0	5.9	1.1	7.6	16.4	8.3	10.2	32.3
	Fees per dentist	5.2	6.1	6.2	6.5	6.1	6.9	7.1	6.8	7.0	6.9	7.4	7.2
	No. of quest. returned	5	25	55	62	41	61	11	80	175	90	116	378
	No. replied	5	25	54	59	40	59	11	76	165	82	104	324
Extraction	No. not replied	—	—	1	3	1	2	—	4	10	8	12	54
	% replied	.5	2.5	5.4	5.9	4.0	5.9	1.1	7.6	16.4	8.2	10.4	32.3
	Fees per dentist	4.0	5.6	5.7	5.7	5.7	6.3	6.2	6.5	6.6	8.6	6.8	6.9
	No. of quest. returned	5	25	55	62	41	61	11	80	175	90	116	378
	No. replied	2	17	42	47	29	44	9	76	133	70	69	266
Gold inlay	No. not replied	3	8	13	15	12	17	2	4	42	20	47	112
	% replied	.3	2.1	5.2	5.9	3.6	5.5	1.1	9.5	16.5	8.7	8.6	33.1
	Fees per dentist	20.0	35.5	30.5	33.3	34.1	38.0	34.0	32.3	41.8	37.3	40.7	40.5
	No. of quest. returned	5	25	55	62	41	61	11	80	175	90	116	378
	No. replied	5	25	55	59	39	60	10	76	163	83	101	325
Upper denture	No. not replied	—	—	—	3	2	1	1	4	12	7	15	53
	% replied	.5	2.5	5.5	5.9	3.9	6.0	1.0	7.6	16.3	8.3	10.1	32.5
	Fees per dentist	78.0	89.4	95.0	96.7	92.6	97.0	100.5	101.4	107.7	105.7	115.1	115.4

TABLE A20 (Continued)
Fees Charged for Specified Services

(c) By Age

Age		Under 25	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75 and over
	No. of quest. returned	21	160	182	157	173	128	64	49	52	64	32	7
	No. replied	21	153	170	142	152	121	57	45	43	56	31	7
Prophylaxis	No. not replied	—	7	12	15	21	7	7	4	9	8	1	—
	% replied	2.1	15.3	17.0	14.2	15.2	12.1	5.7	4.5	4.3	5.6	3.1	.7
	Fees per dentist	6.9	7.2	6.9	7.2	6.7	6.5	6.7	6.6	7.2	5.5	6.1	5.9
	No. of quest. returned	21	160	182	157	173	128	64	49	52	64	32	7
Filling	No. replied	21	155	167	142	153	122	46	44	41	57	31	7
(amalgam)	No. not replied	—	5	15	15	20	6	8	5	11	7	1	—
	% replied	2.1	15.7	16.9	14.4	15.5	12.4	4.7	4.5	4.2	5.8	3.1	.7
	Fees per dentist	7.4	7.6	7.4	7.7	7.7	7.6	9.4	7.7	7.7	6.8	7.5	5.6
	No. of quest. returned	21	160	182	157	173	128	64	49	52	64	32	7
	No. replied	21	155	167	142	153	122	56	44	42	57	31	7
(silicate)	No. not replied	—	5	15	15	20	6	8	5	10	7	1	—
	% replied	2.1	15.6	16.8	14.2	15.4	12.2	5.6	4.4	4.2	5.7	3.1	.7
	Fees per dentist	6.9	6.8	6.8	7.2	7.0	7.0	7.2	7.2	7.3	5.7	6.7	5.6
	No. of quest. returned	21	160	182	157	173	128	64	49	52	64	32	7
	No. replied	21	155	170	141	153	122	57	40	43	48	28	6
Extraction	No. not replied	—	5	12	16	20	6	7	9	9	16	4	1
	% replied	2.1	15.8	17.3	14.3	15.6	12.4	5.8	4.1	4.4	4.9	2.9	.6
	Fees per dentist	6.8	6.6	6.6	6.8	6.5	6.6	6.4	6.4	6.4	6.8	5.8	5.2
	No. of quest. returned	21	160	182	157	173	128	64	49	52	64	32	7
	No. replied	14	106	114	124	125	98	47	40	36	48	24	6
Gold inlay	No. not replied	7	54	68	33	48	30	17	9	16	16	8	1
	% replied	1.8	13.6	14.6	15.9	16.0	12.5	6.0	5.1	4.6	6.1	3.1	.8
	Fees per dentist	41.4	40.4	38.8	40.0	40.7	40.7	39.6	38.7	38.5	29.6	31.3	19.8
	No. of quest. returned	21	160	182	157	173	128	64	49	52	64	32	7
	No. replied	21	155	163	142	149	119	57	44	43	61	31	7
Upper denture	No. not replied	—	5	19	15	24	9	7	5	9	3	1	—
	% replied	2.1	15.6	16.4	14.3	15.0	12.0	5.8	4.4	4.3	6.2	3.1	.7
	Fees per dentist	105.7	106.6	106.7	109.2	105.5	108.0	112.2	109.8	110.0	103.1	102.1	89.0

TABLE A20 (Continued)
Fees Charged for Specified Services

(d) By Year of Graduation

Year of graduation		1960 to present	1950-59	1940-49	1930-39	1920-29	1910-19	1900-09	Before 1900
	No. of quest. returned	301	412	142	89	113	18	—	—
	No. replied	288	382	120	80	101	17	—	—
Prophylaxis	No. not replied	13	30	22	9	12	1	—	—
	% replied	29.2	38.7	12.2	8.1	10.2	1.7	—	—
	Fees per dentist	7.2	6.8	6.6	6.5	6.0	6.1	—	—
	No. of quest. returned	301	412	142	89	113	18	—	—
Filling	No. replied	289	381	121	78	100	17	—	—
(amalgam)	No. not replied	12	31	121	11	13	1	—	—
	% replied	29.3	38.6	12.3	7.9	10.1	1.7	—	—
	Fees per dentist	7.6	7.5	7.9	7.9	7.0	7.1	—	—
	No. of quest. returned	301	412	142	89	113	18	—	—
	No. replied	289	381	122	77	101	17	—	—
(silicate)	No. not replied	12	31	20	12	12	1	—	—
	% replied	29.3	38.6	12.4	7.8	10.2	1.7	—	—
	Fees per dentist	7.0	6.9	7.2	7.3	6.6	6.6	—	—
	No. of quest. returned	301	412	142	89	113	18	—	—
	No. replied	289	385	121	76	100	15	—	—
Extraction	No. not replied	12	27	21	13	13	3	—	—
	% replied	29.3	39.1	12.3	7.7	10.1	1.5	—	—
	Fees per dentist	6.7	6.6	6.6	6.3	5.8	5.7	—	—
	No. of quest. returned	301	412	142	89	113	18	—	—
	No. replied	200	309	100	67	87	12	—	—
Gold inlay	No. not replied	101	103	42	22	26	6	—	—
	% replied	25.8	39.9	12.9	8.7	11.2	1.6	—	—
	Fees per dentist	39.8	39.0	43.6	40.2	31.5	39.2	—	—
	No. of quest. returned	301	412	142	89	113	18	—	—
	No. replied	285	377	119	78	106	17	—	—
Upper denture	No. not replied	16	35	23	11	7	1	—	—
	% replied	29.0	38.4	12.1	7.9	10.8	1.7	—	—
	Fees per dentist	106.6	106.6	109.7	112.2	103.8	99.9	—	—

TABLE A20 (Continued)
Fees Charged for Specified Services

(e) By Organization of Practice

Net income from practice		Solo practice	Sharing costs	Partnership
	No. of quest. returned	898	151	32
	No. replied	834	132	23
Prophylaxis	No. not replied	64	19	9
	% replied	84.3	13.4	2.3
	Fees per dentist	6.7	6.8	7.5
	No. of quest. returned	898	151	32
Filling	No. replied	835	130	23
(amalgam)	No. not replied	63	21	9
	% replied	84.5	13.2	2.3
	Fees per dentist	7.5	7.6	8.3
	No. of quest. returned	898	151	32
	No. replied	836	130	23
(silicate)	No. not replied	62	21	9
	% replied	84.5	13.2	2.3
	Fees per dentist	6.9	6.9	7.6
	No. of quest. returned	898	151	32
	No. replied	831	128	28
Extraction	No. not replied	67	23	4
	% replied	84.2	13.0	2.8
	Fees per dentist	6.4	6.5	7.6
	No. of quest. returned	898	151	32
	No. replied	658	103	17
Gold inlay	No. not replied	240	48	15
	% replied	84.6	13.2	2.2
	Fees per dentist	38.7	39.0	41.6
	No. of quest. returned	898	151	32
	No. replied	829	132	23
Upper denture	No. not replied	69	19	9
	% replied	84.3	13.4	2.3
	Fees per dentist	106.4	109.0	108.8

TABLE A20 (Continued)
Fees Charged for Specified Services

(f) By Number of Employees

Net income from practice		Number of employees full time, part time 0 and 0	0 and 1	0 and 2+	1 and 0	1 and 1	1 and 2+	2+ and 0	2+ and 1	2+ and 2+
	No. of quest. returned	62	37	14	406	159	53	241	82	40
	No. replied	58	36	12	387	142	51	212	71	35
Prophylaxis	No. not replied	4	1	2	19	17	2	29	11	5
	% replied	5.8	3.6	1.2	38.6	14.1	5.1	21.1	7.1	3.5
	Fees per dentist	5.6	6.2	7.1	6.6	6.8	6.8	7.3	6.7	7.7
	No. of quest. returned	62	37	14	406	159	53	241	82	40
Filling	No. replied	59	36	12	386	144	51	209	71	34
(amalgam)	No. not replied	3	1	2	20	15	2	32	11	6
	% replied	5.9	3.6	1.2	38.5	14.4	5.1	20.9	7.1	3.4
	Fees per dentist	5.9	7.1	7.5	7.4	7.6	7.8	7.8	8.0	8.1
	No. of quest. returned	62	37	14	406	159	53	241	82	40
	No. replied	59	36	12	386	144	51	210	71	34
(silicate)	No. not replied	3	1	2	20	15	2	31	11	6
	% replied	5.9	3.6	1.2	38.5	14.4	5.1	20.9	7.1	3.4
	Fees per dentist	6.2	6.8	6.7	6.8	7.0	7.1	7.2	7.0	7.3
	No. of quest. returned	62	37	14	406	159	53	241	82	40
	No. replied	59	36	12	380	143	52	213	71	35
Extraction	No. not replied	3	1	2	26	16	1	28	11	5
	% replied	5.9	3.6	1.2	38.0	14.3	5.2	21.3	7.1	3.5
	Fees per dentist	5.6	6.0	6.6	6.3	6.6	6.6	6.7	6.7	6.9
	No. of quest. returned	62	37	14	406	159	53	241	82	40
	No. replied	59	35	8	299	111	44	168	57	27
Gold inlay	No. not replied	3	2	6	107	48	9	73	25	13
	% replied	7.3	4.3	1.0	37.0	13.7	5.5	20.8	7.1	3.3
	Fees per dentist	25.1	6.1	34.4	37.2	39.4	40.8	42.6	40.5	42.7
	No. of quest. returned	62	37	14	406	159	53	241	82	40
	No. replied	60	36	12	387	140	51	207	71	34
Upper denture	No. not replied	2	1	2	19	19	2	34	11	6
	% replied	6.0	3.6	1.2	38.8	14.0	5.1	20.7	7.1	3.4
	Fees per dentist	95.6	101.1	106.7	106.3	108.1	111.3	109.2	107.6	112.4

(g) By Extent of "Busyness"

Fees Charged for Specified Services

Net income from practice		Dentist too busy to treat people requesting appointments	All people requesting appointments received them but dentist felt more rushed and/or worked more hours than liked	Dentist provided dental care for all who requested appointments, had enough but not too many patients	Dentist was not busy enough, would like to have had more patients
	No. of quest. returned	392	250	367	80
	No. replied	366	230	329	73
Prophylaxis	No. not replied	26	20	38	7
	% replied	36.7	23.1	33.0	7.3
	Fees per dentist	6.4	6.6	7.1	7.1
	No. of quest. returned	392	250	367	80
Filling	No. replied	366	227	331	72
(amalgam)	No. not replied	26	23	36	8
	% replied	36.8	22.8	33.2	7.2
	Fees per dentist	7.4	7.5	7.8	7.6
	No. of quest. returned	392	250	367	80
	No. replied	366	228	332	72
(silicate)	No. not replied	26	22	35	8
	% replied	36.7	22.9	33.3	7.2
	Fees per dentist	6.8	6.8	7.2	7.0
	No. of quest. returned	392	250	367	80
	No. replied	364	226	332	74
Extraction	No. not replied	28	24	35	6
	% replied	36.6	22.7	33.3	7.4
	Fees per dentist	6.3	6.4	6.7	7.0
	No. of quest. returned	392	250	367	80
	No. replied	295	184	250	55
Gold inlay	No. not replied	97	66	117	25
	% replied	37.6	23.5	31.9	7.0
	Fees per dentist	38.6	37.5	39.8	39.2
	No. of quest. returned	392	250	367	80
	No. replied	366	227	329	70
Upper denture	No. not replied	26	23	38	10
	% replied	36.9	22.9	33.2	7.1
	Fees per dentist	104.3	106.7	109.9	109.0

TABLE A20 (Continued)
Fees Charged for Specified Services

(h) By Net Income from Practice

Net income from practice		Under $5,000	$5,000-9,999	$10,000-14,999	$15,000-19,999	$20,000-24,999	$25,000-29,999	$30,000 and over
	No. of quest. returned	39	105	165	285	203	107	121
	No. replied	37	101	158	272	185	92	98
Prophylaxis	No. not replied	2	4	7	13	18	15	23
	% replied	3.9	10.7	16.8	28.8	19.6	9.8	10.4
	Fees per dentist	6.4	6.6	6.5	6.8	6.9	6.8	7.0
	No. of quest. returned	39	105	165	285	203	107	121
Filling	No. replied	37	101	158	273	186	91	97
(amalgam)	No. not replied	2	4	7	12	17	16	24
	% replied	3.9	10.7	16.8	29.0	19.7	9.7	10.3
	Fees per dentist	7.3	7.4	7.3	7.5	7.7	7.6	8.0
	No. of quest. returned	39	105	165	285	203	107	121
	No. replied	37	101	158	272	186	91	98
(silicate)	No. not replied	2	4	7	13	17	16	23
	% replied	3.9	10.7	16.8	28.8	19.7	9.7	10.4
	Fees per dentist	6.4	6.6	6.8	7.0	7.0	7.0	7.4
	No. of quest. returned	39	105	165	285	203	107	121
	No. replied	36	98	157	272	185	94	98
Extraction	No. not replied	3	7	8	13	18	13	23
	% replied	3.8	10.4	16.7	28.9	19.7	10.0	10.4
	Fees per dentist	6.3	6.1	6.3	6.4	6.6	6.7	7.0
	No. of quest. returned	39	105	165	285	203	107	121
	No. replied	22	72	118	220	156	82	79
Gold inlay	No. not replied	17	33	47	65	47	25	42
	% replied	2.9	9.6	15.8	29.4	20.8	11.0	10.6
	Fees per dentist	33.0	34.8	35.9	38.4	40.3	44.2	41.1
	No. of quest. returned	39	105	165	285	203	107	121
	No. replied	37	100	158	272	187	91	93
Upper denture	No. not replied	2	5	7	13	16	16	28
	% replied	3.9	10.7	16.8	29.0	19.9	9.7	9.9
	Fees per dentist	97.9	100.1	103.0	104.7	110.6	113.3	118.2

TABLE A21

Percentage Distribution of Dentists by Extent of Busyness

Categories of busyness

(1) Dentist too busy to treat all people requesting appointments.

(2) All people requesting appointments received them but dentist felt more rushed and/or worked more hours than liked.

(3) Dentist provided dental care for all who requested appointments, had enough but not too many patients.

(4) Dentist was not busy enough, would like to have had more patients.

(a) By County

	Category of "busyness" (per cent)				
County	1	2	3	4	Not Stated
Algoma	14.3	—	78.6	7.1	—
Brant	28.6	14.3	57.1	—	—
Bruce	25.0	75.0	—	—	—
Carleton	45.1	19.7	33.8	1.4	—
Cochrane	14.3	57.1	28.6	—	—
Dufferin	100.0	—	—	—	—
Dundas	100.0	—	—	—	—
Durham	50.0	—	25.0	25.0	—
Elgin	21.1	42.1	26.3	10.5	—
Essex	48.2	18.5	25.9	7.4	—
Frontenac	86.7	6.7	6.7	—	—
Glengarry	100.0	—	—	—	—
Grenville	—	100.0	—	—	—
Grey	71.4	28.6	—	—	—
Haldimand	—	100.0	—	—	—
Haliburton	—	—	—	—	—
Halton	46.9	15.6	28.1	9.4	—
Hastings	45.5	36.4	18.2	—	—
Huron	25.0	75.0	—	—	—
Kenora	33.3	33.3	—	33.3	—
Kent	50.0	35.7	7.1	7.1	—
Lambton	72.7	27.3	—	—	—
Lanark	66.6	—	—	33.3	—
Leeds	100.0	—	—	—	—
Lennox-Addington	100.0	—	—	—	—
Lincoln	23.3	60.5	14.0	2.3	—
Manitoulin	—	—	—	—	—
Middlesex	26.7	24.5	46.7	2.2	—
Muskoka	33.3	33.3	33.3	—	—

TABLE A21 (Continued)
Percentage Distribution of Dentists by Extent of Busyness

(a) By County *(continued)*

County	Category of "busyness" (per cent)				
	1	2	3	4	Not stated
Nipissing	70.0	—	30.0	—	—
Norfolk	71.4	—	28.6	—	—
Northumberland	40.0	40.0	—	20.0	—
Ontario	43.5	30.4	21.7	4.4	—
Oxford	46.2	38.5	15.4	—	—
Parry Sound	20.0	—	80.0	—	—
Peel	22.7	27.3	40.9	9.1	—
Perth	20.0	20.0	40.0	20.0	—
Peterborough	40.0	33.3	26.6	—	—
Prescott	100.0	—	—	—	—
Prince Edward	100.0	—	—	—	—
Rainy River	—	—	100.0	—	—
Renfrew	61.5	7.7	15.4	15.4	—
Russell	—	—	100.0	—	—
Simcoe	52.4	28.6	19.1	—	—
Stormont	16.7	50.0	33.3	—	—
Sudbury	28.6	28.6	28.6	14.3	—
Thunder Bay	63.6	18.2	18.2	—	—
Timiskaming	50.0	—	50.0	—	—
Victoria	100.0	—	—	—	—
Waterloo	47.7	18.2	34.1	—	—
Welland	34.8	43.5	17.4	4.4	—
Wellington	76.9	15.4	7.7	—	—
Wentworth	40.0	31.7	26.7	1.7	—
York	21.0	22.5	44.3	12.3	—
Military bases	50.0	—	—	50.0	—
Not stated	34.8	8.7	39.1	17.4	—
Total	36.0	23.0	33.7	7.4	—

(b) By City Size

City Size	Category of "busyness" (per cent)				
	1	2	3	4	Not stated
Under 1,000	40.0	20.0	40.0	—	—
1,000 – 2,499	48.0	36.0	16.0	—	—
2,500 – 4,999	46.3	24.1	25.9	3.7	—
5,000 – 9,999	48.4	21.0	24.2	6.5	—
10,000 – 14,999	57.5	25.0	15.0	2.5	—
15,000 – 24,999	49.2	24.6	21.3	4.9	—
25,000 – 29,999	36.4	18.2	36.4	9.1	—
30,000 – 49,999	42.5	25.0	31.3	1.3	—
50,000 – 99,999	45.1	20.8	27.2	6.9	—
100,000 – 249,999	33.3	25.3	35.6	5.8	—
250,000 – 499,999	44.4	22.6	32.2	.9	—
500,000 and over	19.5	22.2	45.2	13.1	—
Not stated	50.0	—	—	50.0	—
Total	36.0	23.0	33.7	7.4	—

TABLE A21 (Continued)

Percentage Distribution of Dentists by Extent of Busyness

(c) By Age

Age	Category of "busyness" (per cent)				
	1	2	3	4	Not stated
Under 25	14.3	38.1	23.8	23.8	—
25 – 29	22.6	23.3	41.5	12.6	—
30 – 34	30.4	20.4	38.7	10.5	—
35 – 39	36.9	22.3	38.2	2.6	—
40 – 44	49.4	23.5	23.5	3.5	—
45 – 49	40.6	21.9	27.3	10.2	—
50 – 54	36.5	23.8	36.5	3.2	—
55 – 59	42.9	30.6	16.3	10.2	—
60 – 64	38.0	16.0	44.0	2.0	—
65 – 69	39.7	23.8	33.3	3.2	—
70 – 74	30.0	16.7	46.7	6.7	—
75 and over	50.0	50.0	—	—	—
Not stated	33.3	33.3	25.0	8.3	—
Total	36.0	23.0	33.7	7.4	—

(d) By Year of Graduation

Year of graduation	Category of "busyness" (per cent)				
	1	2	3	4	Not stated
1960 to present	22.4	24.8	40.1	12.7	—
1950 – 1959	42.5	20.9	31.1	5.6	—
1940 – 1949	45.0	22.1	27.9	5.0	—
1930 – 1939	38.4	26.7	29.1	5.8	—
1920 – 1929	36.7	22.0	38.5	2.8	—
1910 – 1919	38.9	16.7	38.9	5.6	—
1900 – 1909	—	—	100.0	—	—
Before 1900	—	—	—	—	—
Not stated	29.2	37.5	20.8	12.5	—
Total	36.0	23.0	33.7	7.4	—

(e) By Organization of Practice

Organization of practice	Category of "busyness" (per cent)				
	1	2	3	4	Not stated
Not in private practice	16.67	—	33.33	50.00	—
Solo practice	35.75	22.38	33.74	7.02	1.11
Sharing costs	40.40	23.18	29.14	6.62	.66
Partnership	12.50	25.00	53.13	9.38	—
Other	—	—	—	—	—
Not stated	35.71	42.86	7.14	7.14	7.14
Total	35.60	22.71	33.33	7.27	1.09

TABLE A21 (Continued)

Percentage Distribution of Dentists by Extent of Busyness

(f) According to Type of Practice

Type of practice	Category of "busyness" (per cent)				
	1	2	3	4	Not stated
General practitioner	35.94	22.77	32.97	7.23	1.09
Specialist	31.77	21.18	38.82	8.24	—
Oral surgeon	18.75	6.25	56.25	18.75	—
Orthodontist	34.29	17.14	40.00	8.57	—
Periodontist	25.00	25.00	41.67	8.33	—
Other	40.91	36.36	22.73	—	—
Not stated	33.33	33.33	16.67	—	16.67
Total	35.60	22.71	33.33	7.27	1.09